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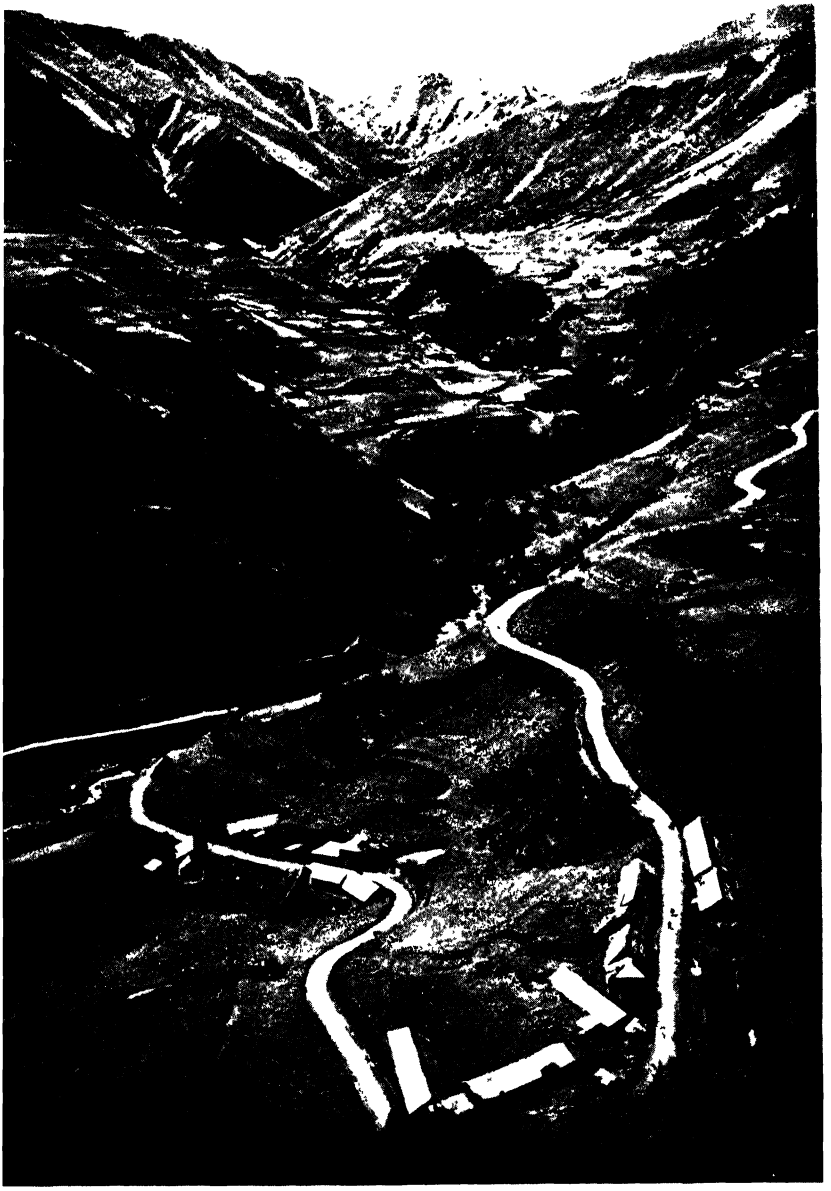
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1. *Mountain Landscape in Eastern Turkey*

B.R. 507A

GEOGRAPHICAL HANDBOOK SERIES

TURKEY

VOLUME II

MARCH 1943

NAVAL INTELLIGENCE DIVISION

This volume was produced and printed for official purposes during the war 1939/45

PREFACE

IN 1915 a Geographical Section was formed in the Naval Intelligence Division of the Admiralty to write Geographical Handbooks on various parts of the world. The purpose of these handbooks was to supply, by scientific research and skilled arrangement, material for the discussion of naval, military, and political problems, as distinct from the examination of the problems themselves. Many distinguished collaborators assisted in their production, and by the end of 1918 upwards of fifty volumes had been produced in Handbook and Manual form, as well as numerous short-term geographical reports. The demand for these books increased rapidly with each new issue, and they acquired a high reputation for accuracy and impartiality. They are now to be found in Service Establishments and Embassies throughout the world, and in the early years after the last war were much used by the League of Nations.

The old Handbooks have been extensively used in the present war, and experience has disclosed both their value and their limitations. On the one hand they have proved, beyond all question, how greatly the work of the fighting services and of Government Departments is facilitated if countries of strategic or political importance are covered by handbooks which deal, in a convenient and easily digested form, with their geography, ethnology, administration, and resources. On the other hand it has become apparent that something more is required to meet present-day requirements. The old series does not cover many of the countries closely affected by the present war (e.g. Germany, France, Poland, Spain, Portugal, to name only a few); its books are somewhat uneven in quality, and they are inadequately equipped with maps, diagrams, and photographic illustrations.

The present series of Handbooks, while owing its inspiration largely to the former series, is in no sense an attempt to revise or re-edit that series. It is an entirely new set of books, produced in the Naval Intelligence Division by trained geographers drawn largely from the Universities, and working at sub-centres established at Oxford and Cambridge, and is printed by the Oxford and Cambridge University Presses. The books follow, in general, a uniform scheme, though minor modifications will be found in particular cases; and they are illustrated by numerous maps and photographs.

The purpose of the books is primarily naval. They are designed first to provide, for the use of Commanding Officers, information in a comprehensive and convenient form about countries which they may be called upon to visit, not only in war but in peace-time; secondly, to maintain the high standard of education in the Navy and, by supplying officers with material for lectures to naval personnel ashore and afloat, to ensure for all ranks that visits to a new country shall be both interesting and profitable.

Their contents are, however, by no means confined to matters of purely naval interest. For many purposes (e.g. history, administration, resources, communications, &c.) countries must necessarily be treated as a whole, and no attempt is made to limit their treatment exclusively to coastal zones. It is hoped therefore that the Army, the Royal Air Force, and other Government Departments (many of whom have given great assistance in the production of the series) will find these handbooks even more valuable than their predecessors proved to be both during and after the last war.

J. H. GODFREY
Director of Naval Intelligence
1942

The foregoing preface has appeared from the beginning of this series of Geographical Handbooks. It describes so effectively their origin and purpose that I have decided to retain it in its original form.

This volume has been written at the Oxford sub-centre of the Naval Intelligence Division, under the direction of Lieut.-Colonel K. Mason, M.C., M.A., R.E., Professor of Geography, University of Oxford, by the geographers whose names are given on page 603.

E. G. N. RUSHBROOKE
Director of Naval Intelligence
MARCH 1943

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CHAPTER XI

DISTRIBUTION OF THE POPULATION

THE total population of Turkey in 1942 (including the Hatay) is estimated at about 18 millions. The area is about 290,000 square miles, or about 3·2 times the size of Great Britain. The density is therefore about 62 per square mile for the whole country, which is abnormally low (Great Britain 468, Greece 135, Bulgaria 154). But this population is very unevenly distributed: in 1935 European Turkey had a density of about 137, the rest of the country about 52; and in Asiatic Turkey it varied from about 152 in the Trabzon vilâyet to about 10 in the region of Lake Van (fig. 1, p. 3). The reason for the great differences is partly geographical and partly political; the greatest percentage increase is probably occurring in the eastern and south-eastern vilâyets (fig. 4, p. 17), regions which suffered most from political troubles and destitution during the years 1914–23, and which are still the least populated, though they are gradually being developed with better communications and more settled conditions of life.

Census Figures

Except for occasional rough estimates, figures for the population of Turkey, and for nationality, religion, and language, have only been recorded twice: in 1927 and in 1935. Estimates during the period of the Ottoman Empire are of very little value, and even the census of 1927 was incomplete and inaccurate. As in all Moslem countries, there was a reluctance to divulge family details; and in Turkey the ingrained distrust of the tax-gatherer, particularly in outlying districts, and the semi-nomadic habits of many of the people, limited the accuracy of the count. By 1935 the secularization of the State and national pride in the new Turkey had overcome many of the old difficulties, and the census figures for that year are much nearer the truth. Since 1935 there have been less detailed, but useful, estimates to work on, particularly in 1940. The figures for the three years are:

	1927	*1935*	*Increase 1927–35*	*1940*	*Increase 1935–40*
European Turkey	1,040,670	1,267,755	227,085	*c.* 1,500,000	*c.* 232,250
Asiatic Turkey .	12,607,600	14,890,265	2,282,665	*c.* 16,369,900	*c.* 1,479,630
	13,648,270	16,158,020	2,509,750	17,869,900	1,711,880

The estimate for 1940 (October) includes the Hatay and allows for about 33,000 killed in the earthquakes of 1939–40. The increase for the period 1927–35 is about 18 per cent., that for 1935–40 about 10 per cent. An annual increase of about 1·8 per cent. may be taken as approximately correct at the present time, the larger figure for the period 1927–35 being due to ineffective census methods in 1927 and to the immigration of Turks from the lost provinces of the Ottoman Empire. The present annual increase, 18 per thousand, is likely to continue with improving health, social, and economic conditions, and with the spread of education.

Regional Density

The density of population varies greatly in different parts of Turkey. Fig. 1 shows the density distribution by vilâyets in 1935. The three densest provinces were Istanbul (199·4 persons per square mile), Trabzon (152·3), and the Hatay (120·4 in 1932); the most sparsely peopled are those of Van and the extreme south-east.

European Turkey and the Izmit Promontory (density 111 persons per square mile). Around Istanbul and its home district on both sides of the Bosporus, the many occupations necessary to general business, wholesale trades, commerce and finance, the service of ports and arsenals, lead to high densities. The healthy equable climate is favourable. Moreover, in Istanbul itself the large Greek and Armenian communities have not been disturbed, while in Thrace the expulsion of Greek country folk has been compensated by immigration of Moslems from Greece, Bulgaria, and Russia. To a less extent the same conditions apply to the whole of the Izmit promontory.

The Black Sea Coastlands (density 75). In the Trabzon neighbourhood abundant rainfall maintains luxuriant vegetation for forestry, pasture, and for specialized agriculture in valley bottoms, especially of citrus fruits, tobacco, and nuts. The overseas commerce of Trabzon and its trade-links with Persia help to maintain a considerable business population. The density here, indeed, might have been higher but for the exodus of the old-established Greek community.

The Ereğli–Zonguldak region also has a fairly high density, caused partly by labour required for the timber industry, the coalfields, and the Karabük steelworks. The climate begins to share the conditions of Istanbul and the Marmara coastlands and, though fertility is not exceptional, Istanbul offers a steady market for products of the coastlands, while some places along the coast are growing up as summer holiday resorts for the people of Ankara.

Between Ereğli and Trabzon the whole coastland benefits from an adequate rainfall, with sheltered valleys, ample timber, and other natural resources, and ports such as Samsun and Sinop, which are in touch by road or railway with fertile inland districts.

Western Anatolia (density 75). The Marmara coastlands of Asiatic Turkey and the Aegean coast from Edremit to Söke, with the lowland hinterlands, are well populated. Much of the soil is alluvial or soft rock and is very fertile; the climate is genial with adequate rainfall and

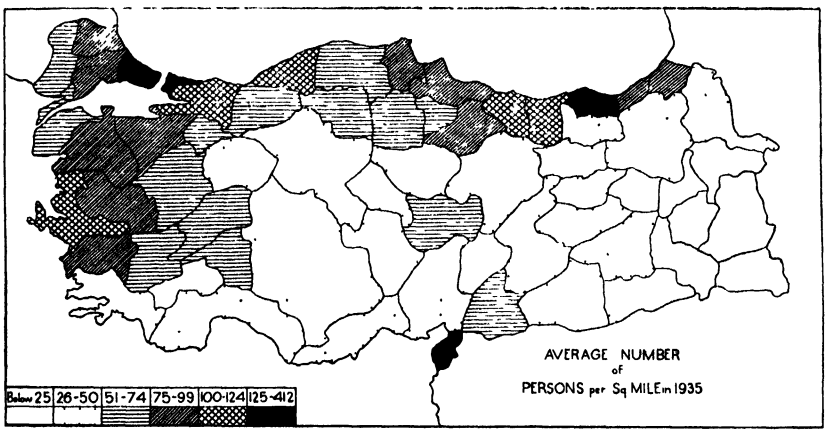


FIG. 1. *Regional Density of Population*

shelter from land winds. Agriculture flourishes, rail communications are fairly good, and roads are improving. Izmir remains the one great commercial port, in spite of its disastrous fire in 1922. Though the large and industrious Greek population has gone, the natural advantages have attracted Moslem immigrants of good quality. Farther inland rail and road centres are similarly favoured, and they form collecting and distributing points for wide areas. In the moist lowlands the disadvantage caused by the prevalence of malaria is gradually being overcome.

Southern Coastlands (density 34). In the rest of western Anatolia, in the rugged south-west highlands, and along the southern coastlands, the density is generally low. Communications have been neglected until recently, the valleys are isolated from each other and from the plateau, and much of the Taurus is given over to pasture or is bare of soil. The ancient prosperity of Lycia, like that of 'rough' Cilicia farther east, was predatory and piratical, and the resident population, dependent on the countryside, is now, as always, sparse.

Irrigation in the Seyhan lowland has not yet relieved the scarcity of population caused partly by the massacres and expulsion of Armenians during the last years of the Ottoman Empire, partly by war losses from 1914 to 1920, and not least by the prevalence of malaria. But progress is being made both here and in the Antalya lowland, where development of roads and the extension of the railway which is planned between Burdur and the sea should lead to a considerable rise in the population.

The Hatay, taken over by Turkey in 1939, is densely populated when compared with the neighbouring provinces. It is well watered and sheltered, has a fertile lowland soil, and specializes in the cultivation of tobacco and cotton. The port of Iskenderon serves a considerable inland region, both Turkish and Syrian, communications are being improved, and it is beginning to export minerals and other commodities from the eastern vilâyets. With proper planning and port development the region has an assured future; but the high density shown on the diagram is based on population figures for 1932, when there was a large refugee population of Armenians and other Christians, some of which may be expected to emigrate.

The Central Plateau. Along the mountain edge of the plateau, particularly in the west, and in the lake district in the south, there are towns—Uşak, Lâdik, and Isparta in particular—which remain traditional centres of carpet-weaving, rug-making, and other local industries, dependent on the wool and goat-hair of the high pastures and of the plateau beyond; but they are few and far between, and they make little impression on the general density of the vilâyets to which they belong. The average density in the western part of the plateau is 47.

On the Central Plateau itself (density 39) aridity has always restricted settlement and even nomadism, but the margins, both eastward round Kayseri and Niğde and westward from Konya to Eskişehir, have moisture enough from neighbouring highlands and from local rains to maintain wide areas of cereal crops, helped near Konya by irrigation (p. 162). These districts benefit also from old centres of transit trade—Kayseri, Konya, Akşehir, Afyonkarahisar, Kütahya—which distribute from main routes into less populous but extensive highland and steppe, and collect produce thence. New industries are being fostered at these centres. Along the northern margin the central administration of Ankara and the improvement of communications radiating from the capital have already raised the density very considerably. Nevertheless, the wide areas that are

sparsely populated reduce the general density of individual provinces such as Konya and Ankara to less than 50 persons per square mile.

Eastern and South-eastern Turkey (densities 21 and 36 respectively). The physical and economic factors already outlined for the Hatay, and the improvement of communications beyond the Anti-Taurus, have favoured the region west of the Euphrates, where Gaziantep is a town of 57,300 inhabitants; but farther east the highlands of south-eastern and eastern Turkey—always desolate, with a harsh climate and difficult transport problems—have become depopulated, especially towards the Persian and Russian borders, through prolonged maladministration, massacre and deportation, and severe war damage. Most villages were destroyed in the districts of Van, Şatak, Başkale, Berwari, Koçanis, Tkhuma, and Tiari, the homelands of the Armenians and of the Assyrian highlanders. But in the upper valleys of the Kizil Irmak, the Euphrates, and the Tigris there are sheltered fertile depressions, which with improved communications are capable of considerable development. Diyarbekir, Urfa, Malatya, Sivas, and Erzurum each have over 34,000 inhabitants; Elâziz is growing rapidly; the railway to Erzurum completed in 1939, and that from Elâziz under construction by Çapakçur to Muş and Lake Van, will open up much of this country to economic development; it is already significant that the population is increasing rapidly with the establishment of law and order among the Kurds.

Distribution by 'Nationality' or Origin

Geographical reasons for different densities of population have been considered. But there are others resulting from diverse elements in the population, their origins, culture, and way of life. The exceptionally mixed heritage of races, languages, and religions, resulting from geographical position and history, has been described in vol. I, chap. ix, and the long and complex history of the people in chap. viii. The Ottoman conquerors were few in number, and were precluded by religion and policy from absorption among the earlier inhabitants, and many of the present population are descended from non-Ottoman elements who have remained racially or culturally segregated sometimes in national and confessional *millets*, the abolition of which is very recent (I, p. 336). Under the new constitution the word 'Turk' is a political, not an ethnological term, and in this modern sense it is no longer correct to speak of 'Turks' in central Asia. All persons now born in Turkey, whatever their race, creed, or speech, have Turkish nationality, and all public concerns such as

banks, railways, and industries are in Turkish hands, though the principal ethnological and religious groups are still concentrated in interesting and significant ways by geographical and historical influences. These are summarized below.

The *Ottoman Turks* have always tended to concentrate in a few urban or suburban centres; but there has also been a considerable class of Turkish landowners, occupying and cultivating lands conferred on them for military or administrative service, employing peasant labour and craftsmen of their district, like English squires after the Norman Conquest. It is undoubtedly to their personality and influence that the very wide acceptance of Islam and of Turkish speech among the peasantry is due, and through their example and influence that these people have inherited those stubborn fighting qualities so often shown on the field of battle.

The *Arabs* (*c.* 154,000), racially akin to their neighbours of Iraq and Syria, have mostly been long established within the present boundaries of Turkey. Turks now by nationality, they are still concentrated near the southern frontiers, in the Hatay, and in the Seyhan lowland. Nearly all are Moslems, and some are still semi-nomadic.

The *Kurds* (*c.* 1,500,000) for the same general reasons inhabit eastern and south-eastern Turkey, but are hill-men. Whereas the Arabs in Turkey are only a small minority of the Arabs as a whole, the Kurdish homeland is largely within Turkey, though the Kurds have expanded all along the mountains of western Persia, and there is a minority within the borders of Iraq. They are governed by hereditary chiefs and are fanatical Moslems. Most are pastoral, many are nomadic, migrating seasonally into Syria, Iraq, or Persia for winter pasture, and returning to their mountain homes in summer. Predatory by instinct, and for centuries by habit, most of those in Turkey have been brought during recent years under State control, forced to give up raiding, their national pastime, and to adopt a sedentary life. Recalcitrants are removed and trained to useful work elsewhere.

The *Armenians* before 1915 were the most numerous Christian group outside the Greek and Russian Orthodox, forming three separate Churches, Gregorian, Catholic, and Protestant (I, pp. 345–6). Under Ottoman rule they had been persecuted for many years; in 1909, 30,000 perished at Adana, and during the war of 1914–18, when they rose and supported the Russian invasion, many were slaughtered or driven into Persia, Iraq, and Syria. Their hopes of an

independent Armenia, often frustrated, were momentarily realized in 1919, and part of the State then constituted survives as the Armenian Soviet Republic, with its capital at Erivan and an estimated population (1939) of 1,280,000. Very few are left in their old homeland, and almost all Armenians now in the country reside in Istanbul. A few scattered families live on sufferance in provinces in the interior, and there are a considerable number at Ordu on the Black Sea coast. Most, if not all, of those who lived in the Hatay when it was ceded to Turkey in 1939 moved at once into Syria. The majority of those who remained in Turkey had previously been forced by persecution to become Moslems, and it will be interesting to see whether under the new laws of tolerance any will revert to Christianity. There were about 58,000 Armenians in 1935.

The *Lazis* (*Turk*: Lazes; *c.* 63,300) and *Georgians* (Ajars; *Turk*: Acars; *c.* 57,300) are indigenous peoples, the former mostly in the Rize vilâyet, the latter east of the Çoruh river and on the Russian borders (I, p. 347). The *Russians* (4,800) are only distinguished from their Georgian neighbours by their Orthodox religion. They form a small residue in north-east Turkey.

The *Circassians* (*c.* 92,000) are Moslem *muhacirs* (p. 15), or their descendants, who either emigrated from the Caucasus during and after the Russo-Turkish wars of 1856–78 and 1914–18, or came as slaves in the nineteenth century. They now maintain small colonies throughout Turkey, especially in Thrace and north-west Anatolia, and also in the Seyhan lowland.

The *Tatars* (15,600) are Tatar or Mongol immigrants from central Asia, some direct, others after long residence in territories now Russian. In Turkey, few in number, they are widely scattered.

The *Persians*, number unknown, are naturally found in the south-eastern and eastern districts. Some are immigrant traders or artisans, but there are old-established groups which have become included in Turkish territory by frontier changes. They have declined in numbers considerably in the last twenty years.

There are now no *Assyrian* (*Nestorian*) *Christians* (I, p. 348) left in Turkey as a separate community. Driven from their highland home in Hakâri during the War of 1914–18, the remnants are now settled in the Khabur district of north-eastern Syria. A few who were left have become absorbed in the local population, and some, mostly women and children, are said to have become Moslems or joined Moslem households.

The *Greeks* have been drastically reduced from *c.* 2,500,000 in

1912 to *c.* 78,000 in 1927, first by the wars between 1912 and 1923, and later by the exchange of populations under the Treaty of Lausanne (1923). Over 800,000 Greeks are said to have fled from Izmir alone after the military disaster in September 1922. By the Lausanne agreement 1,300,000 Greeks were compelled to leave Turkey while about 350,000 Turks returned from Greece to Anatolia (I, p. 348). There was further emigration when the Labour Law (1932) excluded many from their trade or profession. Most of the 108,700 Greek-speaking Turks who appear in the 1935 census are of Greek origin and live in the Istanbul district, their privileged home for centuries. Of the persons of Greek nationality (17,650) still living in Turkey (1935), about seven-eighths also reside in the European provinces, almost all of them remaining members of the Orthodox Church.

The *Pomaks* (32,700), in European Turkey, are thought to be descendants of Thracian peoples displaced by the Bulgars. They are nearly all Moslems, though one authority has placed them as former Christian heretics (Adoptionists or Bogomils) who preferred the piety of the Moslems to the 'pagan' practices and persecution of both the Greek Orthodox and the Roman Catholic Churches.[1]

Other Foreign Elements. Bosnian, Albanian, Bulgarian, Serbian, and Hungarian Turks, together with a few of Romanian, Polish, Croat, Czech, and Slovene origin, are scattered throughout Turkey, but most are in the towns of the north-west and of Thrace. They are descendants of immigrants who left their respective countries while under Ottoman rule or at the time of separation. Most have now become absorbed in the Turkish population and have lost their separate identity.

The following are approximate numbers of foreign subjects in Turkey and of Turkish subjects abroad in 1935:

Foreign subjects in Turkey		*Turkish subjects abroad*	
Greek	17,650	South America	65,000
Italian	7,550	U.S.A.	45,400
Persian	4,100	France	36,100
Yugoslav	3,050	Russia	25,900
British	2,800	Greece	22,400
Bulgarian	2,600	Egypt	9,300
German	2,150	Syria	9,200
French	2,000	Cuba	3,800
Russian	1,600	Romania	2,700
Others (none over 1,500)	10,000	Others (none over 2,000)	13,300
	53,500		233,100

[1] Sir Edwin Pears, *Turkey and its Peoples* (1912).

Of the other Turks speaking a European language—French, German, Italian, or English—as their mother tongue, a large number were brought up in foreign 'concessions' or in consular households. They live mainly in coastal districts, especially in the west and south. Many of the British subjects resident in Turkey are Maltese.

Distribution by Culture

Language. Turkish is the official language of the Republic. It has long been the common speech in town and country, outside the Arab, Kurd, Greek, Armenian, and eastern groups, such as Lazis and Persians, and certain communities of European origin. Immigration of Turks from former parts of the Ottoman Empire, and the expulsion of Greeks and Armenians, have contributed to raise the number and proportion of persons whose mother tongue is Turkish. Out of the total population of about 16,158,000 in 1935, no fewer than 13,899,000, or 86 per cent., were Turkish-speaking.

Many Kurds, Armenians, and Greeks, directly subject to Turkish law since the abolition of the *millets*, and whose position might be compared with that of Scots or Welsh people in Britain, often speak Turkish as their prime language; many consider themselves and wish to be considered as Turks. On the other hand, some Moslem immigrants, mainly from Crete, Epirus, and Thrace, still speak Greek as their mother tongue. The following figures for 1927 are instructive:

Greeks (Turkish subjects)		
Greek-speaking	57,300	77,230
Turkish-speaking	14,790	
Armenian-speaking	5,140	
Armenians		
Armenian-speaking	59,600	77,430
Turkish-speaking	17,830	

Corresponding figures for later years are not available, but it is probable that the number of Turkish-speaking subjects of Greek and Armenian origin has risen steadily.

One community, however, shows little disposition to adopt the Turkish language. As shown in vol. I, p. 349, the Jews in Turkey are of two kinds, *Ashkenazim*, mainly of German, Polish, or Russian origin, and *Sephardim*, of Spanish or other Mediterranean descent. The latter are mostly descendants of Jews who fled from Spain to Istanbul during the persecutions of Ferdinand and Isabella. Of

81,870 Jews recorded in Turkey in 1927, no fewer than 68,900 or 84 per cent. spoke Yiddish, 3,650 or 5 per cent. retained Spanish, and only 9,320 or 11 per cent. had adopted the Turkish language.

In 1935 the principal language groups were as follows:

Turkish . . .	13,899,100	(86 per cent.)
Kurdish . . .	1,480,200	(9 per cent.)
Arab . . .	153,700	(*c.* 1 per cent.)
Greek . . .	108,700	
Circassian . . .	92,000	
Laz	63,300	
Armenian . . .	57,600	
Georgian . . .	57,300	
Yiddish . . .	42,600	

Literacy (fig. 2). An important change in modern Turkey was the substitution of the Latin for the Arabic alphabet in November 1928 (I, p. 351). The old script had always been an obstacle to literacy, and though there was confusion at first, the beneficial results were already manifest by 1935.

The definition of literacy for statistical purposes is ability both to read and to write; among the illiterates a small number can either read or write. In 1935 literacy was at a maximum among males between the ages of 9 and 40 (50–28 per cent.) and among females between 9 and 19 (35–25 per cent.); in both cases the highest proportion was at 11 years. More than 80 per cent. of the men over 50 and 90 per cent. of the women over 25 were illiterate, the percentage number of illiterates increasing rapidly with age. These figures reflect the lack of education among Moslems of the Ottoman period, especially among women, its spread within recent years, and the determination of the State authorities that the mass of the people shall be able to read and write, however great the difficulties. From an examination of fig. 2 it is easy to see that, if nothing were done to spread education among adults, it would not be till 1955 that half the men under 50 and a quarter of the women under 40 would be literate. Hence the very great importance of evening schools and Peoples' Houses which are both contributing so much to the spread of education among the adult population.

Religion. In the constitution of 1923, Islam was established as the State religion, as in the Ottoman Empire; but in 1928 Turkey became secularized, religion became an entirely personal affair, and complete freedom of worship was tolerated (I, p. 350). Nevertheless, Islam remains the religion of the vast majority, and in 1935 Moslems numbered 15,838,700 or 98 per cent. Christians accounted for about

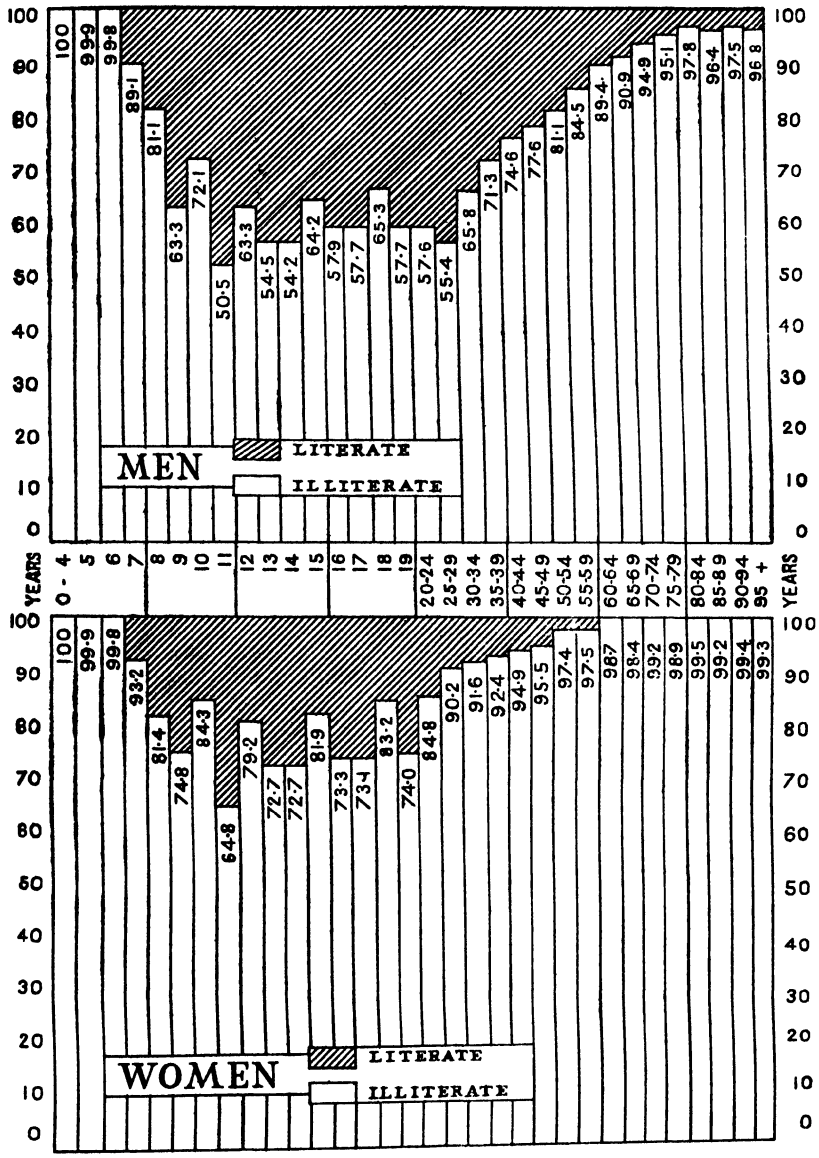


FIG. 2. *Percentages of Illiterates by Age-groups, 1935*

226,200, Jews 78,700, and there were about 14,000 of other religions or none. The Christians were subdivided as follows:

Greek Orthodox	78,000
Russian Orthodox	47,000
Gregorian	44,500
Catholic	32,200
Armenian	11,200
Protestant	8,500
Others	4,800
	226,200

Moslems belong predominantly to the Sunni sects; country people and the older people are more tenacious and observant of their faith than those in the larger towns and than the younger generations.

Social Distribution

Age and Sex (fig. 3). A study of the census figures for 1935 reveals some interesting facts relating to age and sex groups. In that year approximately 7,936,770 were males and 8,221,250 females, the ratio of 1,000 males to 1,035 females being normal, thereby showing that the proportion of the sexes had been restored after the losses incurred from 1912 to 1922. These losses were, however, still marked in the age-groups. Over half the population (60 per cent. of the total males) were under 25 years of age, and nearly one-third (46 per cent. of whom were men) were between 25 and 49. Very few were over 70. The adult man-power was still low for the total population, but with every year the position was becoming more favourable. Of the 'under twenty-fives' 53 per cent. were males. These facts show how improved the man-power must be by 1942, since many of the young in 1935 have grown up, and there were comparatively few old men to die.

Births and Deaths. Few definite figures are available for births and deaths. The birth-rate is given as 40 per 1,000, the death-rate as 23 per 1,000, the natural increase being therefore 17 per 1,000. In 1935 there were 2,728,910 children of 4 years old or less, so that the average number of births for each of the four previous years was about 682,230, a figure which confirms the stated birth-rate and one which may be increasing.

No accurate figures for total deaths or death-distribution are available, but the causes of death in twenty-two chief towns of vilâyets for 1936 were as follows (Adana, Afyonkarahisar, Ankara, Antalya, Aydin, Balikesir, Çanakkale, Çankiri, Çorum, Denizli, Diyarbekir,

Eskişehir, Isparta, Istanbul, Izmir, Izmit, Kirklareli, Kütahya, Manisa, Mersin, Samsun, and Tekirdağ):

Cause of death	
Bronchitis, influenza, and pneumonia	4,641
Heart and vein diseases	4,336
Enteritis	3,918
Tuberculosis and lung diseases	3,666
Congenital diseases	2,414
Paralysis and cerebral diseases	2,095
Cancer, infectious and parasitical diseases	1,726
Old age	1,541
Nerve and various organic diseases including suicides	1,455
Malaria	1,192
Digestive and liver diseases	1,010
Homicide and accidents	624
Diabetes, rheumatism, gout, alcoholism, and similar diseases	495
Typhoid, paratyphoid, and exanthematic fever	425
Measles, scarlet fever, whooping cough, and diphtheria	300
Puerperal diseases	200
Other causes	562
	30,600

Total deaths in these twenty-two towns were 35,638 in 1937, 36,590 in 1938, 34,200 in 1939, and 38,380 in 1940.

Marriage and Divorce. Total marriages recorded during the period 1937–40 were as follows:

1937	26,050
1938	29,250
1939	33,060
1940	34,180

The last two years included the Hatay. In 1940 most marriages were recorded in the vilâyets of Istanbul (6,710), Izmir (2,410), and Ankara (1,600).

The age of most men on marriage in recent years has been between 25 and 30; that of most women was between 19 and 24 until 1938, since when it has dropped to between 15 and 18, possibly because of war factors. The next frequent marriage-age for men is from 30 to 34, while that for women is now from 19 to 24. Few men marry below 18, few women over 40. The general increase in the marriage-age of both men and women since Ottoman times is striking, and is the result of economic and social changes, better education, the growing recognition of the responsibilities of marriage, and the desire for more healthy offspring.

Divorce has increased steadily from 2,127 in 1930 to 3,485 in 1938, 3,863 in 1939, and 4,027 in 1940. Most, like the marriages, were in

the populous vilâyets of Istanbul, Izmir, and Ankara, which had averages between 600 and 150 in 1940, when figures for the whole country showed about 11·8 divorces for every 100 marriages.

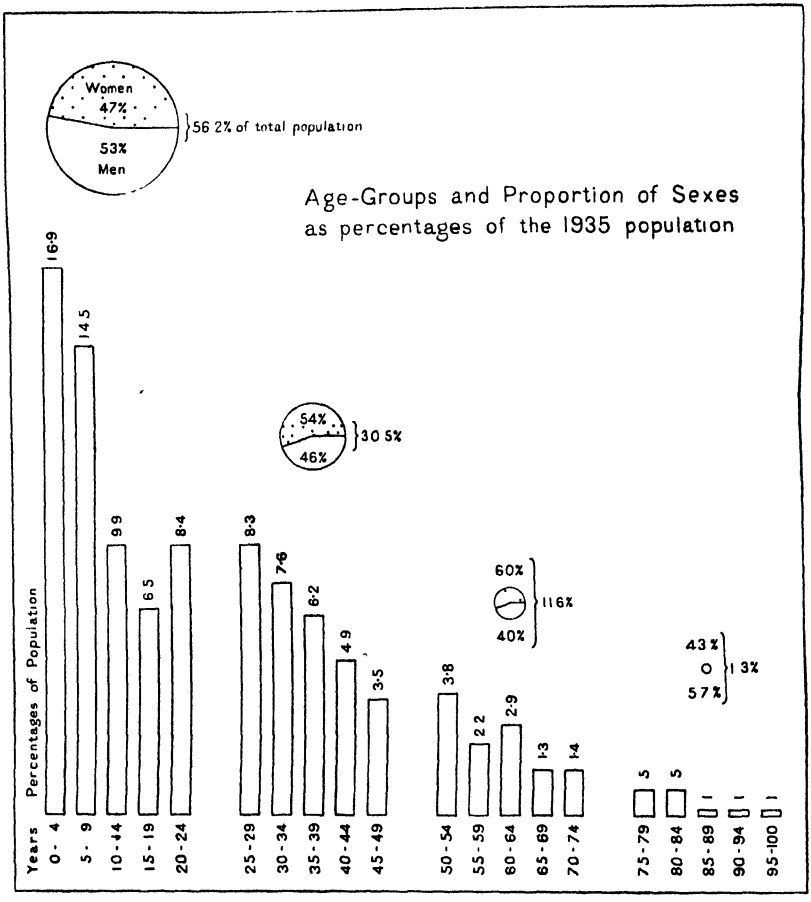


FIG. 3. *Age and Sex, 1935*

Movement and Change of Population

Emigration and Immigration. In addition to the large-scale 'political' emigration of Armenians, Assyrians, and Greeks between 1914 and 1923, the 'nationalization' of Turkey has caused many foreigners to leave the country. Many British (chiefly Maltese), Greek, Italian, Yugoslav, and Persian subjects emigrated when the 1932 law excluded them from their occupations. Between 1927 and 1935 the foreign

population of Istanbul vilâyet, where foreigners were numerous, decreased by 22,000, though the total for the city itself has steadily increased (690,850 in 1927; 741,150 in 1935; 789,350 in 1940). The departure of Armenians from the Hatay in 1939 has already been mentioned (p. 7). Kurds, Christians, and Jews have also emigrated in recent years from south-east Turkey into Syria, Iraq, Persia, and Palestine.

On the other hand, immigration has been much encouraged under the Republic, since there is ample room for more people, especially in regions evacuated by the emigrants, and the development of modern Turkey demands an increasing man-power. Discrimination is made, however, between true Turks with 'racial, linguistic, and cultural affinities' with Turkey, and those Moslems who, irrespective of race or speech, were always admitted to the Ottoman Empire, and whose designation, *muhacirs*, is now applied to non-Turkish Moslems, though it originally included all Moslems emigrating from a non-Moslem to a Moslem country. Bosnians, Albanians, and Pomaks with Turkish sympathies are often excluded now, if they do not speak Turkish; but Romanians, Bulgarians, and some Yugoslavs are constantly immigrating. Between 1920 and 1927 about 600,000 *muhacirs* are thought to have entered, though this figure includes 400,000 Turks repatriated from Greece, some of whom spoke Turkish. Later statistics show about 835,000 immigrants between 1923 and 1940, including 172,900 (mostly from Bulgaria and Romania) between 1935 and 1940. The Government recently planned to absorb 35,000 immigrants annually, including (under a five-year plan agreed with Romania in 1936) about 14,000 Turks a year from the Dobruja, and the Turkish minority from Yugoslavia (under a six-year plan adopted in 1938). It is unknown to what extent these schemes have been carried out; but at the outbreak of war, about a million and a quarter Turkish-speaking Moslems of provinces of the Ottoman Empire were said to be still outside Turkey, of whom about 800,000 were in Bulgaria, 200,000 in the Dobruja, 150,000 in Macedonian Yugoslavia, and 80,000 in Western Thrace, belonging to Greece, who were left there by agreement as compensation for the Greeks who remained in Istanbul at the time of the exchange of populations. It was expected that by 1960 most Turks from the Balkans would have immigrated to Turkey.

Other Turkish-speaking peoples outside Turkey are mainly in the neighbouring republics of the U.S.S.R., but these do not supply many immigrants, and neither Russia nor Turkey is desirous of their

movement. In Asia there are few, unless Cyprus, where 18 per cent. of the population is Turkish in origin, is included.

Since the outbreak of war in 1939 immigration has decreased; the total number of immigrants for the year ending March 1941 was only 8,740, less than one-quarter of the planned quota.

The immigrants are usually settled among a Turkish nucleus, so that they may be readily absorbed. They go chiefly to the European provinces and those of Bursa, Balikesir, Izmir, Samsun, Giresun, and Trabzon, and along the main railway routes. Many districts in central, south-eastern, and eastern Turkey are still underpopulated. Developments in agriculture (especially irrigation), hygiene, transport, and industry should assist colonization. About 1937 some thousands of Moslem immigrants from Bulgaria passed through Trabzon on their way to Iğdir, a cotton-growing district adjoining the Russian frontier. In the five years from 1936 to 1940 the average annual State expenditure on immigration was about £T. 2,768,400.

Internal Movement of Population. There is available little definite information of the internal movement of population; but in addition to progressive urbanization (p. 18), the following points are noteworthy:

(i) Of 15,195,290 persons born in Turkey, 13,623,050, or nearly 90 per cent., were living in their native district in 1935; 425,935, or over 2 per cent., were in other districts of their native vilâyet; the remainder, 1,146,305, or less than 8 per cent., were found in vilâyets other than those in which they had been born. The figures indicate a natural tendency to stability.

(ii) Seasonal migration, though less than formerly, is still practised in the pastoral districts of the plateau, but more particularly in eastern and south-eastern Turkey. Herdsmen and shepherds move with their beasts between summer pastures (*yayla*) in the hills and winter pastures (*kışla*) on the low ground (I, fig. 79, p. 356). Often they take their tents, but in many parts they have permanent dwellings in both places. Seasonal migration is a habit imposed by natural conditions, but it often tends to lawlessness, and it is discouraged by the new economic and legal measures taken by the State.

(iii) The depopulated eastern and south-eastern provinces are apparently being reinhabited, but there is little definite information available (p. 5). Strong measures to bring the Kurds within the law, the exploitation of natural resources, the building of factories and agricultural stations, and the improvement of communications must all tend to open up these remote parts of the country.

(iv) In parts of the western plateau certain villages are said to be still derelict since the evacuation of the Greeks and Armenians, Turks having also moved to the towns and to centres more accessible to road and railway. Such villages must await the development of communications before being re-established. Many villages are also derelict in the Giresun, Trabzon, and Kars vilâyets.

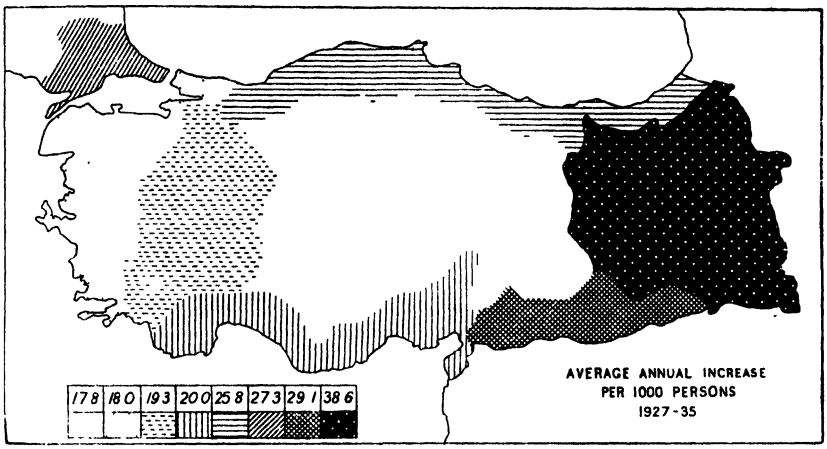


FIG. 4. *Regional Increase of Population*

Regional Increase in Population. Some of the remarks on natural increase, the movement of population, and economic development noted in the preceding pages are illustrated in fig. 4, which shows the regional increases per thousand of the population in 1927 between that year and the census year of 1935. The increases in the coastland vilâyets and the encroachment in those regions now supplied by communications are well shown; but the heavy increases indicated for the provinces of the east and south-east are to some extent fallacious, owing to the incompleteness of the 1927 census. This is perhaps obvious by comparing this diagram with fig. 1, which shows how underpopulated the eastern and south-east provinces of Turkey still are. A truer picture of what is happening here will be obtainable after the next census.

Distribution by Occupation

In 1935 men and women workers were distributed as follows (percentages are of the total working population):

Agriculture	6,480,068	81·8 per cent.
Industries (*see below*)	656,421	8·2 ,,
Public services, administration, and professions	398,338	5·0 ,,
Commerce, transport, communications	339,922	4·3 ,,
Domestic services	46,456	0·7 ,,
	7,921,205	100·0 ,,

The number of men and women workers in these categories totalled 7,921,205 or nearly half the population, the other half being made up of unclassified workers, unemployed, the aged, the sick, and the young. The distribution of workers among the chief industries was as follows (percentages are of the total industrial workers):

Clothing	103,071	15·7 per cent.
Food, drink, and tobacco	86,906	13·2 ,,
Textiles	83,961	12·7 ,,
Building and furniture	80,011	12·2 ,,
Timber	65,397	10·0 ,,
Metallurgy	57,904	8·8 ,,
Mines, quarries, and salt	18,735	2·9 ,,
Rubber, leather, bone, amber, and celluloid	17,028	2·6 ,,
Stone, pottery, and glass	16,186	2·5 ,,
Machines, instruments, and other apparatus	14,451	2·2 ,,
Miscellaneous	112,771	17·2 ,,
	656,421	100·0

The proportion of men and women in each occupation is shown in fig. 5. Four points are outstanding from these facts. The first is that the overwhelming majority of both sexes are agricultural workers. Secondly, there is no greatly predominant industry, though clothing, food and drink, and textiles—that is, the immediate necessities of life—account for over 40 per cent. of the workers, while most of the remainder are distributed over a large number of smaller industries. Thirdly, although men still outnumber women in every occupation except domestic service, women are now found in almost every calling; the number of adult women is unspecified, but about 2,734,000 are employed in agriculture. Lastly, in all the specified occupations, the majority of employees are between 15 and 35 years of age, a fact consistent with the age-groups of the population as a whole.

Urban Population

As in most European countries, there is some movement from the country into the larger and more prosperous towns, whose populations are increasing rapidly, apart from birth-rate increase, and even in spite of recent earthquake casualties in such towns as Erzincan,

Sivas, Tokat, Amasya, Ordu, Izmir, Bergama, Foça, and Dikili (I, pp. 393–5). The growing towns are of two types—large, well-established cities such as Izmir, Bursa, and Adana, whose amenities constantly attract more inhabitants, and the smaller, more remote centres, such as Kayseri, Ereğli (Konya vilâyet), Malatya, Turhal, and Iğdir, where new factories and improved communications provide employment for local peasants. Many of those, however, who

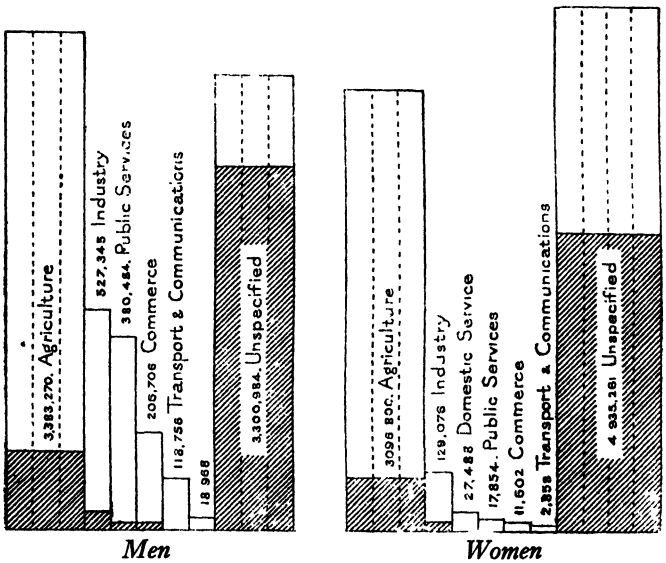


FIG. 5. *Distribution of Population by Occupation (Children of 14 and under are shown shaded)*

leave their farms to earn better money in a factory or other urban employment return to the country after a few months or years, with capital saved for their farm needs. Some of the urban population, therefore, must be regarded as temporary.

Nevertheless, as would be expected in an agricultural country, less than a quarter of the total population is urban. The chief cities and their approximate population are given below. The marked increase in most towns in recent years is mainly due to the developing artisan and professional class. Ankara, Izmir, and Istanbul had approximately 155,550, 184,350, and 789,350 in 1940. Only six other cities have numbers exceeding 50,000, and twelve others have over 30,000, including the four ports of Zonguldak (37,400), Samsun (36,900), Trabzon (33,050), and Mersin (30,200). A more detailed list of towns

and their populations at the census of 1935 appears in Appendix A, and a gazetteer of inland towns in Appendix B.

Population of Chief Cities

Over 100,000	*1935*	*1940*	*30,000–50,000*	*1935*	*1940*
Istanbul	741,150	789,350	Edirne	36,100	45,150
Izmir	170,950	184,350	Diyarbekir	34,650	43,250
Ankara	122,700	155,550	Sivas	33,900	41,250
			Malatya	27,300	38,000
			Manisa	30,900	37,700
50,000–100,000			Zonguldak	20,600	37,400
Adana	76,450	90,000	Samsun	32,500	36,900
Bursa	72,200	77,350	Erzurum	33,100	36,400
Eskişehir	47,050	60,600	Urfa	31,700	34,850
Gaziantep	50,950	57,300	Trabzon	29,700	33,050
Konya	52,100	56,700	Maraş	29,400	30,700
Kayseri	46,200	53,900	Mersin	27,600	30,200

The transference of the capital inevitably resulted in a decrease at Istanbul and an increase at Ankara. Istanbul contained over 1,000,000 inhabitants before 1914, i.e. nearly a third more than the present population (789,350 in 1940). Ankara, on the other hand, has grown since 1923 from insignificance to a town of 155,550 inhabitants. While Istanbul had the advantage of a rich hinterland, a pleasant climate, and the control of the very important European–Asiatic and Black Sea–Mediterranean traffic, Ankara, although isolated on a bleak exposed steppe, is in the centre of Turkey and at a relatively safe distance from the wars, intrigues, and other undesirable influences of Europe, which the Republic has tried to avoid; and great efforts have been made to make the modern city worthy.

Short descriptions of these two cities are given below, but the port facilities of Istanbul are summarized with those of other ports in Chapter XII.

ISTANBUL (Constantinople, Stamboul; *class.* Byzantium: Constantinopolis). 41° 00′ 06″ N., 28° 58′ 14″ E. Pop. 789,350 (1940).

Istanbul stands on the European side of the Bosporus (*Boğaz Içi*), on a promontory bounded on the south by the Sea of Marmara, on the east by the Strait, which is here about a mile wide, and on the north-east by the Golden Horn (*Haliç*), the submerged valley of the Alibey Su and Kâğithane Su which reach sea-level at the Sweet Waters of Europe about 6 miles to the north-west. North of Seraglio point it is about half a mile wide, but between the bridges only about 700 yards, widening again above them off Eyüp. Within the promon-

tory, and nearly parallel with its north shore, a smaller valley (*anc.* Lycus), now obstructed by debris, reaches the Marmara shore at Vlanga Bostan (*class.* 'Harbour of Theodosius'), now silted and built over. North of this valley a low ridge, steep towards the Golden Horn, is divided by small streams into six 'hills'; south of it a seventh 'hill' overlooking the Marmara completes a sentimental resemblance to the site of Rome. North of the Golden Horn a third ridge runs nearly parallel, and ends steeply in the foreland of Pera and Galata, commanding both the Bosporus frontage (Tophane, Dolmabağçe, and Ortaköy) and the Golden Horn. All the frontage of Istanbul, Pera (now Beyoğlu), and Galata is steep-to, but there is beach with sunken valley-lagoons farther west, and up the Golden Horn towards the Sweet Waters.

History

The growth of the city was in three main phases. (1) In 658 B.C. Greek colonists from Megara, between Athens and Corinth, founded *Byzantium* on the seaward end of the promontory, with its port on the north side, 'opposite the city of the blind'; for other Megarians had missed the site and settled at Chalcedon (*mod.* Kadiköy) across the Strait. Byzantium flourished, becoming in turn a Persian vassal (510–479 B.C.), an ally of Athens in its first and its second league of cities, a stubborn defender of its own independence against Philip of Macedon (340 B.C.), and a loyal ally of the Romans against Antiochus of Syria and Mithridates of Pontus. Its command of the Strait, its ferry-traffic, its fisheries, and its position as a port of call contributed to its prosperity. Though hardly a trace of its original wall remains, it seems to have extended landward from Seraglio point as far as the present outer bridge, the Burnt Column, the mosque of Ahmed I, and the modern lighthouse. In A.D. 196 it opposed the emperor Severus and was destroyed, but was restored under the name of *Antonina*, and the Hippodrome was begun at this time.

(2) In A.D. 328 Constantine I chose Byzantium as his imperial capital, and on 11 May 330 *Constantinopolis* was inaugurated as the 'New Rome'. His walls enclosed what then seemed a vast area, from the Pantepoptes church by the inner bridge, round the west slope of the 'fourth hill', on which the mosque of Mohammed II has replaced the Church of the Apostles, to the Marmara shore, where the processional west gate is marked by the Isa Kapu mosque. Its civic centre, the Forum of Constantine, lay round the 'Burnt Column', and was traversed by the 'midway' street (*Mese*) from the citadel and

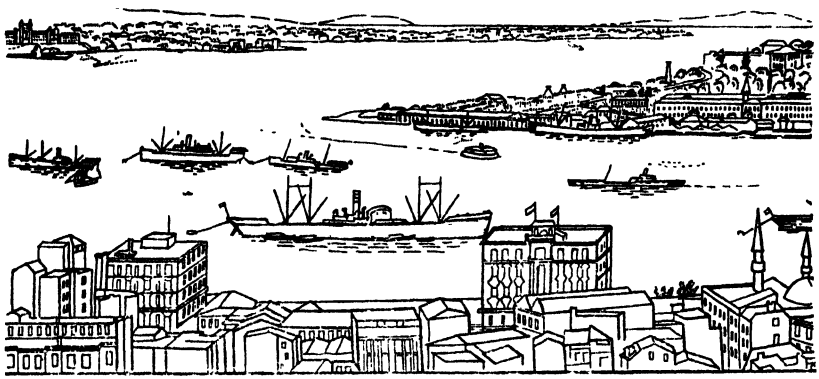
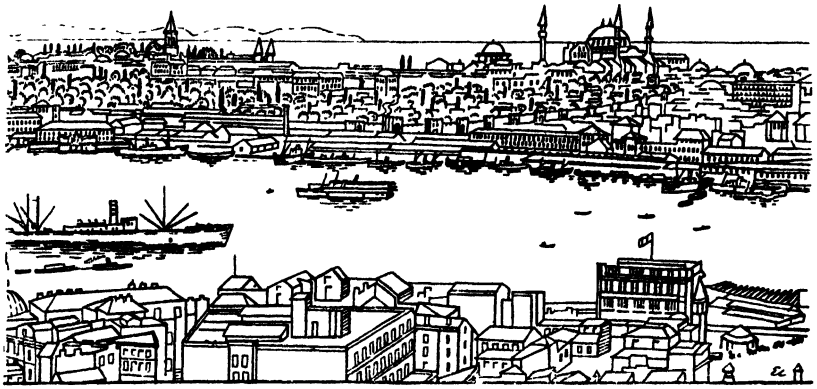


FIG. 7. *Istanbul, the Bosporus, and the Golden*

palace on the promontory, parallel with which ran one other main street on either hand. Pera and the north-west suburb Blachernae were fortified independently, to command the Golden Horn.

(3) These defences resisted the Goths after the disaster at Adrianople (A.D. 378), but the city grew beyond all expectation; the aqueduct of Valens—visible between the 'third' and 'fourth' hills, and still in use—was only the first effort to meet its need of water, and in 413 Theodosius II fortified an even longer land-front of 4 miles, from the Golden Gate on the Marmara shore (called *Yedikule Kapusi* from the 'Seven Towers' added by Mohammed II) to Blachernae, which defended its northward junction with the new sea-wall up the Golden Horn. Midway on the Marmara frontage, the sunken mouth of the Lycus stream now became the Harbour of Theodosius, and other small coves were utilized later. To the Forum of Constantine, Theodosius added a second and larger centre (south of Eski Saray on the 'third' hill); and from the Amastrian Forum, farther west again (at the Şehzade Mosque), a new 'midway' to the Isa Kapu and the Golden Gate traversed the 'Forum of the Ox' (*Ak Saray*) and that of Arcadius (*Avret Pazar*: *c.* 400) inland of the Harbour of Theodosius.

To these defences Marcian (450–7) added a line of outposts from Silivri to Lake Derkos (now Terkos); but the city never spread beyond the walls of Theodosius. They were frequently renovated (as after the earthquake in 447) and reinforced, notably by Heraclius (627), Leo V (813), and Manuel Comnenus (*c.* 1150), especially at their weakest point, south of Blachernae, where the fortress became a frequent abode of the emperors. But it was near the middle point,



Horn, looking south-east from Galata

at the gate of S. Romanus (*Top Kapusi*), that the Turks entered in 1453. The total circuit, now about 14 miles, was adopted by the Ottoman conqueror, and remains the boundary of modern Istanbul.

The city has been often attacked, and taken at least twice. In 616 it was besieged by the Persians under Chosroes II, in 626 by the Persians and Avars. In 668 it was besieged by the Arabs (Saracens)—one of whose standard-bearers, Ayub (Job), gave his name to the suburb of Eyüp—and again in 716–18, but on both occasions the Arabs were compelled to withdraw. Expeditions by the Muscovites (Russians) took place in 865, 904, 941, and 1043. The Latins occupied and plundered the city in 1203–4 and held it till 1261. It was besieged by the Turks under Murad II in 1422, and was finally taken on 29 May 1453, by Mohammed II, surnamed 'the Conqueror' (*Fatih*).

Lack of consecutive planning, and numerous fires, have substituted for the earlier thoroughfares a maze of irregular alleys, only gradually adapted to modern traffic. The Grand Bazar (Bezesten) on the ridge links the site of Constantine's Forum with that of Theodosius; the At Meydan covers the Hippodrome, of which the middle line is marked by its monuments, the 'Snake Column' from Delphi (479 B.C.), the Egyptian obelisk of Theodosius I (378–95), and the 'colossus' restored by Constantine V Porphyrogenitus (10th cent.); substructures of the imperial palace support those of the 'Blue Mosque' of Ahmed I; and a few names of gates and of churches converted into mosques are ancient landmarks.

Principal buildings of the Christian city, in order of date, are:

on the Asiatic, Beykoz, Anadoluhisar, Kandilli, and Beylerbey; all connected by steam ferries from the outer bridge. Between Üsküdar and Kadiköy is Haydarpaşa, the Asiatic railway terminus (p. 268). Of these suburbs, the chief are Galata, Pera, and Üsküdar.

Galata (*class.* Sykai, 'fig-trees') was fortified by Constantine, but was assigned by Michael Palaeologus (1267) to the Genoese merchants who had helped him to recover the city from the Franks. Contrary to agreement, they fortified Galata in 1348, built the Tower as their citadel, and gave much trouble. In 1453 they were neutral, but were disarmed and put to tribute by Mohammed II 'the Conqueror'. Galata is still the business centre, with main street behind the waterfront, and a funicular railway up to Pera.

Pera, on the high ground overlooking the Golden Horn, is essentially European and residential, with many embassies and hotels; its *Grande Rue* (now Istiklâl Caddesi), with modern shops, runs nearly north–south along the ridge; it was rebuilt after fire in 1870, and is continued beyond the Taksim reservoir and National Monument by the high road to Büyükdere and Tarabya (Therapia).

Üsküdar (*class.* Chrysopolis, *Eng.* Scutari), as its Persian name ('courier') implies, was long the starting-point for travellers and caravans for the East. It lies on the sea-front of M. Bulgurlu, and is still a typically oriental town, with many mosques. But its port is superseded by Haydarpaşa and it is now mainly residential. Southward it is bounded by the great cemetery, Büyük Mezaristan, traversed by the highway to Izmit. West of this, on Kavak point, are the Selimiye barracks (built in 1807 for the new *nizam* levies of Selim III), the Military Hospital and Medical School, and the British cemetery of Crimean war-graves. South of this, Haydarpaşa is the railway terminus, with steam ferry to Istanbul (p. 270); Kadiköy (*class.* Chalcedon) is a pleasant residential quarter.

Water-supply and Climate

The water-supply of Istanbul is good and plentiful. It comes (*a*) from streams west of the city; (*b*) from rain-fed reservoirs (*bent*) in the Belgrat forest 10 miles to the north-west; one of which was built by Mahmud I (1732) to supply Pera and Galata, through the Taksim cistern. The aqueducts are underground, except where they cross a valley, e.g. those of Valens (in Istanbul, p. 22), of Justinian (*Muallak Kemer*), and of Andronicus; (*c*) from Lake Terkos on the Black Sea coast, transmitted (29 miles) by pumping and Eğri Kemer aqueduct. Within the city are large open reservoirs—of Arcadius,



2. *Istanbul. Fortress of the Seven Towers*



3. *Istanbul. Byzantine Ramparts*



4. *Part of New Ankara*

Aspar, and Mokius—and vast vaulted cisterns, one of which (*Yeribatan Saray*) is still in use.

The city is generally healthy—apart from some malaria, which has decreased in recent years—because of its position, natural drainage, and Bosporus currents. There has been no serious epidemic since the cholera of 1866. The climate is changeable, with extremes of heat and cold: dry, fine, healthy, and of even temperature from May to September inclusive; rainy between October and March. The Black Sea winds are wet and cold, those from the Marmara more genial. Snow falls every winter, but severe frosts are rare.

Though Istanbul is essentially an administrative capital, its great size and commanding position make it a commercial city also. It draws food-supplies from European Turkey, from Black Sea, Marmara, and Aegean ports, and from abroad, and distributes as widely the surplus of Turkish produce. It is a port of call and traffic on the great routes between Europe and Anatolia by road and rail, and between the Black Sea and Mediterranean by sea. As the Ottoman capital, it was the supply base of army and fleet, and attracted every kind of skilled craftsman to its immense bazaar. Though political changes have diminished its population and administrative primacy, and the railway port of Haydarpaşa diverts much of its Anatolian trade, Istanbul remains a busy and cultured city, and has been allowed to retain the large Greek and Armenian minorities to whose enterprise it has long owed much of its economic importance.

Though the neighbourhood is not very fertile, except the sheltered Bosporus shores, farm products and fish come from all parts and are plentiful.

For Banks and Industries, *see* Chapter XV.

Plans for the New City

In 1938 plans for the improvement of Istanbul were sanctioned by the Turkish Government. To what extent they are in abeyance as the result of the war is not known. The chief points are as follows:

From Yenikapu a large avenue will cut across the town to Atatürk Bridge now under construction between the upper and lower pontoon-bridges, and along it will be built a university town, parks, and stadium. The avenue will continue beyond Atatürk Bridge through Pera by Azap Kapu, Toz Koparan, Tarlabaşi (behind the British Embassy), Taksim, and thence down to the Bosporus, a route roughly identical with that over which the galleys of Sultan Mohammed II,

the Conqueror, were dragged overland from the Bosporus to the Golden Horn during the siege of Constantinople in 1453.

At Dolmabağçe, next to Abdul Mejid's palace, an area will be reserved for bathing, the hills above towards Yildiz Saray being converted into public parks. The Karaköy (Galata) Bridge is to be moved farther inside the Golden Horn, with large squares at either end, thus increasing the port and shipyard facilities. From the Galata end of the Karaköy Bridge a new avenue across the hills overlooking Tophane, Findikli, and Kabataş will terminate in Pera at Taksim Square. Thus instead of the present single thoroughfare to Pera there will be three: the avenue from Atatürk Bridge, the present Istiklâl Caddesi ('the Avenue of Independence', formerly Grande Rue de Pera) widened, and the new avenue from Karaköy Bridge. Taksim Square, widened by demolition of old barracks and other buildings, is to be the centre of Pera, with the National Monument, an exhibition building, and a theatre.

The area between the Sultan Ahmed mosque, S. Sophia, the Old Seraglio, and the sea, is to be a preserve for Byzantine and Ottoman art. If, as has been proposed, the railway terminus and port of Sirkeci are withdrawn beyond the walls, perhaps near Yenikapu, a viaduct from the Istanbul side of Karaköy Bridge, following the sea-front through Eminönü and Sirkeci, will end at Seraglio point, and will lead up to the preserve. The dilapidated buildings which now surround monuments of archaeological or architectural value will be removed and replaced by squares.

Summer resorts in the neighbourhood are also to be improved and rendered accessible to visitors by fast boats and good roads.

For port facilities, *see* Chapter XII.

ANKARA (Angora, Enguru: *class.* Ancyra). 39° 57′ N., 32° 54′ E. Alt. 3,100 ft. (railway stn. 2,788 ft.; observatory 2,824 ft.; town 2,775 ft.). Pop. 155,550 (1940; 140,000 (1935); 20,000 (1918)). *Hotels*: Ankara Palace, Bellevue, Lausanne, Taşhan, Eti, and other inns and restaurants. *Banks*: Central, Iş (business), Ottoman, Agricultural, Immobilière, Sümer (industrial), Eti (mining), Ada-pazari (commercial). *Embassies and legations*, mostly in Çankaya suburb. Consulates, theatres (2), cinemas, sports-ground, exhibition building, museums (2), libraries (3), bourse, hospitals.

The new capital of the Turkish Republic occupies a commanding position in the heart of Anatolia 75 miles from the Black Sea, 125

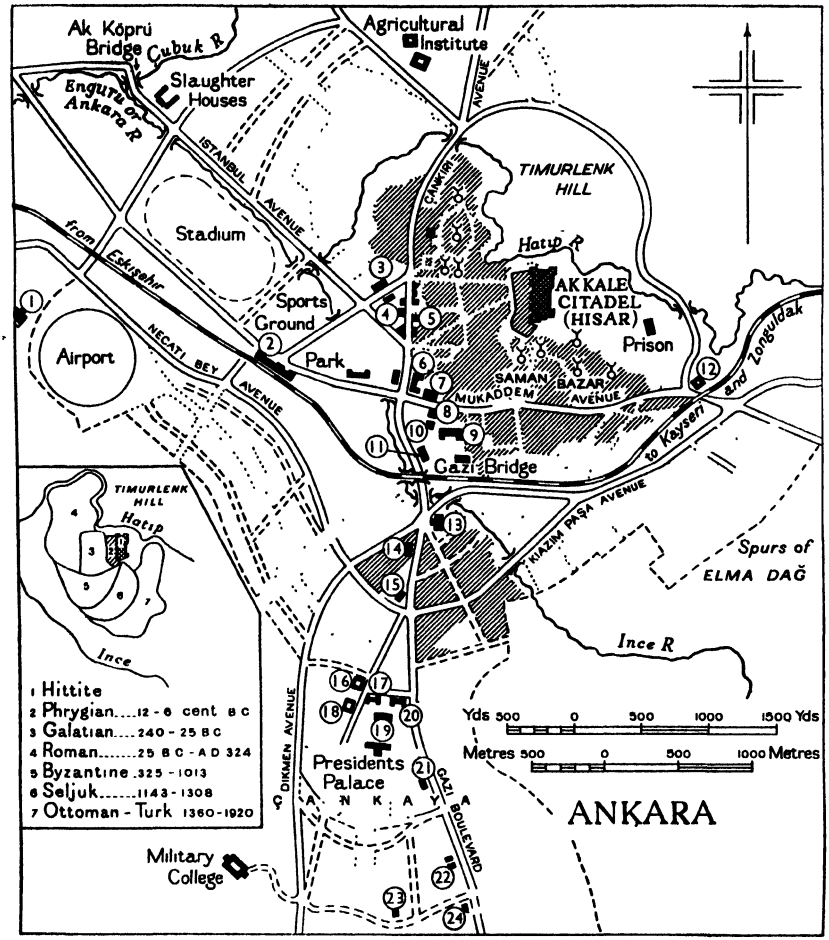
miles from the Marmara, 250 miles from the Mediterranean; in the same latitude as Madrid, Washington, and Pekin.

History

Ankara was already an ancient city in Hittite times; an important Phrygian fortress and sanctuary (1200–700 B.C.); capital of the Galatian Celts till it was taken by Attalus of Pergamum (229 B.C.), and of the Roman province of Galatia (25 B.C.). Here, on the Temple of Rome and Augustus, was inscribed the *Monumentum Ancyranum*, a record of his achievements. In Byzantine times it was an important commercial and military centre. It fell temporarily to Harun-ar-Rashid in 797, and to the Seljuk Sultan, Kilij Arslan II, in 1158. The fortress was rebuilt by Kaikavus II (1249–50). The first Turkish coins were struck here (*c.* 1300). When the Seljuk Empire collapsed in 1308, the religious Ahi order dominated Ankara till it was surrendered to Orkhan (1354) and to Murad I (1360) and became the Ottoman base for conquests in eastern Anatolia. Here Tamerlane (*Turk*: Timur Lenk, 'the Lame') defeated Bayazid I (1402), but thereafter the city remained under Ottoman rule, except during Mehemet Ali's destructive raid (1841). At Ankara, in April 1920, Mustafa Kemal established the seat of government and the National Assembly and People's Party, and on 29 October 1923 proclaimed the Turkish Republic.

Site

Ankara lies on the eastern margin of the wide upper valley of the Enguru (Ankara) tributary of the Sakarya, and commands communications with the middle course of the Kizil Irmak and the headwaters of the Black Sea drainage. The Enguru river is formed by the confluence of three head-streams. (*a*) The Çubuk from the north, after supplying the new reservoir for irrigation, emerges through a great dyke of basalt, and turns westward about a mile north of the city. (*b*) From the south several streams, of which the Ince is the most easterly, drain the northern slopes of the Elma Dağ ('Apple Mountain') through deep narrow valleys: the Ince drains the small lakes Moğan and Emir; where it leaves the high ground it receives the Kavakli stream from the east and passes through marshes to join the Enguru below the ancient Akköprü bridge (A.D. 1222) on the Ankara–Istanbul road. (*c*) Between Çubuk and Ince the torrential Hatip or Kayaçe Su drains M. Idris and the Human-Oğlu uplands towards the watershed, but has had to cut through an abrupt north-



KEY

1. Gazi Institute.
2. Railway Station.
3. National Assembly.
4. Ankara Palace Hotel, State Bank, Agricultural Bank, and Ottoman Bank.
5. School of Arts and Crafts.
6. Ministry of Foreign Affairs.
7. School of Commerce.
8. People's House.
9. Hospital.
10. Ethnographical Museum.
11. Ismet Pasa Institute.
12. School of Music.
13. Ministry of Hygiene.
14. Council of State.
15. Red Crescent Headquarters.
16. Ministry of National Defence.
17. Ministry of Justice.
18. General Staff Headquarters.
19. Ministry of the Interior.
20. Ministry of Public Works.
21. U.S.S.R. Embassy.
22. German Embassy.
23. French Embassy.
24. Hungarian Embassy.

FIG. 9. *Plan of Ankara*

to-south ridge of basalt (3,209 ft.) by a precipitous gorge, which turns first north and then south round the Haci Bayram (2,905 ft.) and Dar Tepe (2,936 ft.) spurs before joining the Ince above its confluence with the Çubuk near the Stadium (I, photo. 74, p. 160).

This rugged ridge, immediately south of the gorge, and 400 feet above the Hatip stream, is crowned by the ancient citadel, Ak Kale; the classical Ancyra occupied its steep western slope; the medieval city lay along the ridge and spread over its gentler southward slope towards the Kavakli stream, protected eastwards by the Çarkkale outwork and the Kayabaşi spur (3,018 ft.) commanding the upper entrance to the gorge. North of the ravine the ridge is broader and less abrupt, forming Timurlenk hill (Olucak Tepe: 3,264 ft.), quite remote from the city and assigned now to Kurdish settlers.

Though Hittite and earlier monuments have been found on the site of Ankara, the primitive hill fort is completely disguised by the oblong Seljuk citadel (*Ak Kale*), overlooking the gorge to the east and north, with formidable walls and forty-one towers to the west and south: it is crowded with fine timber houses, and is entered by the Zindan Kapu gate in the south wall. On the west and south it is enclosed by the outer fortress, about three times its area, with towers along its wall, entered by the Hisar Kapu gate at the south end, and containing the Ala-ed-din mosque (*c.* 1200) and many old buildings. On the steep western slope lie the chief Roman monuments, the Temple of Rome and Augustus, and the column of Jovian (363–4). Farther south are the great Seljuk *hans* and older mosques. Traces of walls, which were the extreme bounds of the medieval city, descend from the north-west angle of the fortress into the gorge, which is defended by a massive water-gate, then follow the Hatip north-west to defend Haci Bayram and Dar Tepe and the old tanneries of Dabağhane: above the confluence of Hatip and Ince, the wall turns south along the edge of the marshes, then east and north above the Kavakli valley, and rejoins the citadel at the Çarkkale outwork. But much of this urban area was probably never occupied by buildings, and is only now being covered by the modern city.

The Town

Modern Ankara began to grow on the completion of the railway from Eskişehir, following the Enguru plain to a terminus west of the Ince and about a mile from the citadel; whence it is now continued round the south end of the ridge by the Kavakli valley into the upper Hatip, for Sivas and Kayseri.

The town plan designed by Hermann Jansen in 1926 is in course of execution: its main features are as follows. Across the Ince marsh an embanked Station Avenue leads north-east to the foot of the ridge. This is crossed by Istanbul Avenue following the old road south-east from the old Akköprü bridge. Both avenues end on Gazi Boulevard, which runs from north to south between the Çankiri high-road northward and the new southern quarters of Yenişehir and Çankaya on the spurs of Elma Dağ beyond the Ince–Kavakli valley. Parallel with Istanbul Avenue and the Stadium, Mukaddem Avenue leaves the Istanbul highway by a new bridge over the Enguru, passes the railway station, and traverses the ridge eastwards into the upper Hatip valley, crossing Gazi Avenue at the Ministry of Foreign Affairs. Between the Istanbul, Gazi, and Station Avenues the whole area has been rebuilt, with the National Assembly, principal ministries, banks, and hotels; and a new modern quarter rises above the National Square (Millet Meydani) toward the citadel, on ground devastated by fire in 1917 and 1930. Other important buildings—the People's House, Ethnological Museum, Hospital, and Ismet Paşa Girls' Institute—lie along Gazi Avenue, below which the Ince marshes are being reclaimed as parks. Other public gardens between Çankiri and Istanbul Avenues are watered by the Hatip before it joins the Ince. In the older parts of the city, steep narrow alleys and older houses remain; and buildings of historical or artistic interest are carefully conserved. The Temple of Rome and Augustus is being disengaged from later buildings and serves as an open-air Museum for large sculptures and inscriptions.

Beyond the limits of the city, the most important suburb is Çankaya, which rises to 3,280 feet on a spur of Elma Dağ, beyond the Gazi bridge over the Ince. Here the President's Palace, stately and luxurious, is surrounded by the offices of the General Staff, the Ministries of National Defence, Justice, and Public Works, and the principal embassies and official residences. Their modern architecture is diversified with national characteristics, among well-planned avenues and gardens. Other residential suburbs are projected, south-east at Cebeci in the Kavakli valley, south-west beyond the Ince, and north-west at Etlik on foothills beyond the Çubuk. About 2 miles west of the railway station, on the south side of the Enguru plain, is Gazi Çiftlik, the experimental farm laid out by Atatürk and given by him to the nation. The airfield is in the plain west of the railway and stadium. Here are also the Boys' High School and the Gazi Institute for training teachers and craftsmen.

Though Ankara has not the splendid historic buildings of Istanbul or Sivas, it preserves—besides the Temple of Rome and Augustus (*c.* A.D. 14)—five Seljuk mosques earlier than 1300, and another dozen before 1500, of which that of the scholar and teacher Haci Bayram (*c.* 1400) is the most interesting architecturally; and several medieval fountains. The Bezesten ('cloth market', *c.* 1470) and other medieval *hans* illustrate the commercial prosperity of Ankara in the eighteenth century, and many fine timbered houses its culture.

Modern monuments include the Security group in bronze, in the public garden, and equestrian statues of the Gazi in Millet Meydani and in front of the Museum on Gazi Avenue. Other collections of ancient remains besides the Museum are at the Temple of Augustus, the Haci Bayram mosque, and the Ak Kale citadel. There are growing libraries at the National Assembly, the Ministry of Education, the People's House, and the newly founded University.

Climate

The climate is continental, cold in winter (Jan. 31° F.) with snow (I, photo. 105, p. 226); hot and dry in summer (July 73° F.), but cool at night: rainfall 10·1 inches (abs. max. 14·1), mostly in winter: on neighbouring snow-covered hills 13·8 inches. The sky is usually clear, and evaporation large and variable (1927, 10·8 in.; 1928, 80 in.); the neighbouring Lake Moğan, 6½ feet deep in spring, is dry from June to September. But the friable soil absorbs rainfall rapidly. Prevalent winds vary from north to north-east in summer and autumn to south-west in February and May. The site was formerly malarious; sanitation is now modern and good.

Industries and Occupations

Though essentially an administrative city, Ankara is an important distributing centre for manufactured imports, and a market for local produce—wool, mohair, carpets, barley, fruit, honey and beeswax, gum-tragacanth. The apples of the Elma Dağ are famous; the best were introduced from England by agents of the East India Company about 1600. Though the district is dry and bare since antiquity—the nearest natural woodland being at Bolu (90 miles NW.)—afforestation is successful, especially with acacia and sweet-chestnut. Subsoil irrigation with reservoir water has greatly increased the yield of wheat, maize, beans, and vegetables. There is a State silo of 4,000 tons. The long-haired Angora cat, white or grey, of central Asian origin, is now rare; but the Angora goat with long fine white wool

(*tiftik*, *mohair*), also introduced from Central Asia, thrives on all upland pastures of this and neighbouring vilâyets. The traditional manufacture of *challis* and *sof* cloth is, however, almost extinct. There are large flour-mills, a tannery—another traditional industry—a brewery, clothing factory, steel-wire works, cement works, and the military arsenal and munition plant. Building-stone is quarried on Timurlenk hill and Elma Dağ. Lignite is mined at Mamak and coal in the neighbourhood, and there are gas-works in the city; but power is mainly derived from an electricity plant. Current is generated at 20,000 volts, and converted to 220–380 volts for distribution. There is automatic telephone-service, with underground cables, and trunk connexion with Istanbul and Zonguldak.

Communications

Railway to Eskişehir for Istanbul, Afyonkarahisar, and Konya; to Sivas for Samsun and Erzurum; to Kayseri for Adana, Aleppo, and Baghdad. Main roads to Çankiri for the north; east to Yozgat for Sivas and Kayseri; west to Eskişehir for western Anatolia, and to Izmit for Istanbul; track south to Konya.

CHAPTER XII

PORTS

THE coasts of Turkey were described in Volume I, Chapter III. The ports in the present chapter are grouped in four sections of coast: I. The Black Sea; II. The Straits; III. The Aegean; IV. The Mediterranean. Within each section they are in alphabetical order.

On the Black Sea the most important are Trabzon (pop. 33,050), the outlet for caravan trade from Persia, and the northern base for Erzurum; Zonguldak (37,400), the outlet for the Ereğli coal-field and the Karabük steel-works; and Samsun (36,900), the port for Sivas, and for the transhipment and distribution of imports and local produce. Rize (14,700) is becoming a summer health-resort; Giresun (13,950), Ordu (10,100), and all other ports are subsidiary, and serve small separate areas, with poor communications inland.

Of the ports of the Straits, the most important are Istanbul (789,350) for through traffic with Europe and as a port of call between the Black Sea and the Aegean; and Haydarpaşa, terminus of the Anatolian railway to the plateau and beyond. Üsküdar (124,550), an Asiatic suburb of Istanbul, is rather an anchorage and ferry-station than a port. On the European shore of the Marmara, Tekirdağ (Rodosto; 20,350) is the second port of European Turkey, and Gelibolu (6,650) serves its peninsula and southern Thrace. On the Asiatic shore, Bandirma (13,300) is the terminus of the railways to Kütahya, Izmir, and all western Anatolia, and serves the advanced military base at Balikesir; Izmit (18,700), with Gölcük, is the naval base, and serves the Anatolian railway, but is being superseded by Derince for railway coal and other heavy cargoes. Mudanya (5,050) and Yalova (2,650) serve the fertile Bursa district. Çanakkale (11,500) is the port of entry from the Aegean, with garrison and quarantine station. Other ports are of only local utility.

On the Aegean, Enez is an outlet for European Turkey, but the railway from Edirne serves Dedeağaç beyond the frontier. Izmir (184,350) is second in importance only to Istanbul, serving wide fertile lowlands, with railways to the Marmara at Bandirma, to Afyonkarahisar for the plateau by the Gediz and Büyük Menderes valleys, and to Burdur (for Antalya) to the south-east. Ayvalik

(13,100), Burhaniye (5,600), Dikili (3,400), Foça (2,750), Çeşme (3,900), and Kuşadasi (5,850) serve smaller coastal districts, and Küllük gives outlet to local emery.

On the Mediterranean coast, of which a great part is rugged, Mersin alone (30,200) has strategic and economic importance, with wide fertile coastland, mineral wealth, and communications by road and rail with the plateau. Antalya (23,000) also serves a rich coastal plain and new chrome mines, and its landward communications distribute its imports far into western Anatolia, even without the projected railway to Burdur and Isparta. Iskenderon (14,000) grew as the port of Aleppo, and still handles through traffic, while exporting local minerals; as a harbour it rivals Mersin, but its position and communications are less favourable. Of the other ports, mainly concerned with local produce and growing output of minerals, especially chrome, Anamur though small (1,900) is the most active. Payas (6,300), rather a market than a port, has been superseded by its neighbour Iskenderon. Ayaş (3,200) and Taşucu mainly export local grain. Marmaris (2,600) normally traffics with Rhodes, and Andifli (850) with Castellorizo. Fethiye (3,850) has been revived by its chrome mines; Finike (1,250), without that resource, has not outlived the departure of its Greek inhabitants.

PORTS ON THE BLACK SEA

AKÇAABAT (Polatane; *Greek* Platana; *class.* Hermonassus, Hermyse). 41° 02′ N., 39° 37′ E. Trabzon vil.: kaza. Pop. 4,100.

This roadstead is an open bay, 8 miles W. of Trabzon, with hills rising steeply behind. Water is supplied by a small stream between the town and a watch tower to W. The town, protected by C. Yeros on the W., lies in the centre of the bay, with a beach 800 yards long and 150 yards wide. The anchorage in 10–15 fathoms, about ½ mile from the town, is often used in strong NW. winds instead of Trabzon, though large vessels have to make for Sinop. The bottom shelves steeply from 5 fathoms at 1½ cables to 25 fathoms at ¾ mile (photo. 5).

The well-cultivated valley behind the town grows olives, figs, and tobacco: vines are trained to elms, and mulberries are planted around every small enclosure. Electricity is supplied from the Kalenüma valley, the same source as for Trabzon.

It is on the Samsun–Rize coast road.

AKÇAŞEHIR (Akçakoca, Akche Shehr; *class.* Dia, Diospolis). 41° 05′ N., 31° 08′ E. Bolu vil.: kaza. Pop. 2,750.

The small port lies on a fairly straight stretch of coastline in a shallow bay about 52 miles wide between C. Baba and Kefken point, at the mouth of the Fakirli (Akça) R., and backed by high wooded hills.

The town, occupying an ancient site, carries on a small timber trade.

The anchorage, opposite the eastern timber sheds, is 1½ miles off shore in 10 fathoms and exposed to all onshore winds.

A motor-road, fit for light motor-traffic, leads inland to Düzce on the Adapazari–Gerede road.

AK LIMAN. 42° 03′ N., 35° 04′ E. Sinop vil.

Good anchorage about 8 miles W. of Sinop, used by schooners during bad weather. No town, nor communication with interior except by mountain mule-track.

ALAÇAM (Alacham; *class.* Zalecus, Zaliscus). 41° 34′ N., 35° 35′ E.; alt. *c.* 330 ft. Samsun vil.

A minor port (no details). The town, on rising ground on bank of Alaçam stream, about 1¼ miles from the coast and 18 miles W. of C. Bafra, exports local tobacco. Coastal motor-road to Sinop and to Rize. A water-mill is 1 mile S.

AMASRA (Amassera, Amasreh; *class.* Sesamus, later Amastris). 41° 48′ N., 32° 25′ E. Zonguldak vil. Pop. 4,000 (1895).

The town is on a double promontory, precipitous seaward, with weathered ridge and landward slopes (photo. 6; I, p. 41). On a sandy ridge between promontories the sea breaks in heavy weather, and a bridge has been built. About 200 yards N. of the E. point is an islet separated by 9–14 fathoms. On both sides of the low narrow isthmus are landing-places, and beaches, commanded by medieval walls and modern batteries. The neighbourhood is well cultivated, and vegetables, fruit, poultry, and eggs are exported to Istanbul.

Port. Anchorage, though restricted, is good, SE. of the town in 3–8 fathoms, protected from N. winds by an islet and reefs, with a breakwater *c.* 350 yards and accommodation for 2–3 vessels of 1,000 tons d.w., but heavily silted and obstructed by wreckage; improvements were projected (1942) as the Ereğli coal-field probably extends E. of Amasra. Ancient harbour works are reported SW., but the

E. part of this bay is clear, in 7–10 fathoms. A cove SW. of the town (depth 2–8 fathoms) exposed to W. winds, and fringed by rocks, is visited by small craft during E. winds in summer. Here a small shipyard builds *kayiks* of 30–40 tons with local timber.

Motor-road to Bartin (10 miles).

AYANCIK. 41° 57′ N., 34° 36′ E. Sinop vil.: kaza. Pop. 2,550.

A small port at mouth of Kozlu R., between Stefano point and Kuildi reef, 22 miles SW. of C. Ince. Coasting-craft anchor abreast of the river. Open beach, accessible in all weathers; large metallic structure for loading timber from local saw-mills into lighters, capacity 2,648,600 cu. ft. per annum. Track to Taşköprü 30 miles inland. No further details.

BARTIN (Bartan, Bartheni; *class.* Parthenium). *c.* 41° 37′ N., 32° 20′ E. Zonguldak vil.: kaza. Pop. 8,850. Hotels (3). Iş and Agricultural banks. Prison. Electricity station (small).

Bartin lies SE. of the mouth of the Bartin Su, the former boundary of Bithynia and Paphlagonia, SW. of Amasra point. The town is built on two low limestone hills, and the streets are paved with limestone blocks. There are saw-mills using local timber, especially boxwood. Timber, cereals, apples, eggs, and poultry are exported, and small craft built.

Port. The sea is 3 fathoms deep near the shore and about 8 feet on the sandbar across the mouth of the river, the narrow channel over which lies between rocks. The river is about 175–350 feet wide. Inside the bar the water is 4–5 fathoms deep. Coasters can go upstream *c.* 6 miles as far as Bartin. This is the only river harbour on the Black Sea coast of Turkey. Harbour obstructed by bar, and therefore of limited value, though used by schooners up to 250 tons.

Motor-roads NW. to mouth of river, NE. to Amasra, and SE. to Safranbolu for Kastamonu.

BENDER-EREĞLI[1] (Erekli; *class.* Heraclea Pontica). 41° 19′ N., 31° 26′ E. Zonguldak vil.: kaza. Pop. 5,850. Electricity station (small).

This anchorage is protected by C. Baba from prevalent NE. winds and winter storms, but is exposed to winds between SW. and NNW., and there is generally a swell. It is used in foggy weather by vessels

[1] Distinguish Bender-Ereğli, port, from Ereğli, town, in Konya vil.: 37° 31′ N., 34° 02′ E. (App. B), and from Ereğli on the Marmara, 40° 58′ N., 27° 58′ E.



5. *Akçaabat, with C. Yeros in the distance*



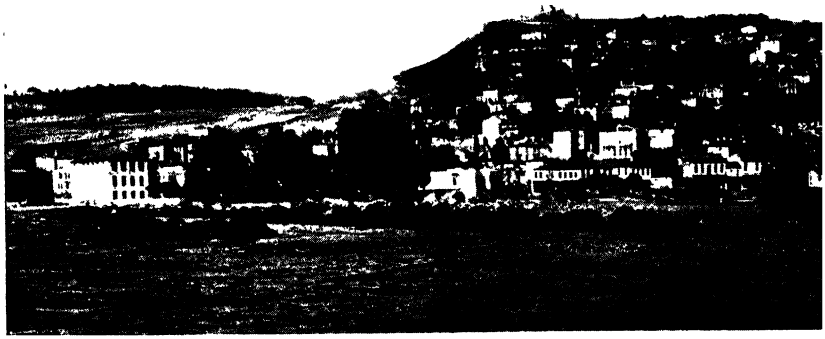
6. *Amasra*



7. *Coaling-lighters at Ereğli*



8. *Ereğli, from the north-west*



9. *Lighter-breakwater, Ereğli, from the west*

bound for the Bosporus, but is unsafe.[1] A breakwater has been projected. Coal is brought from smaller anchorages (*see below*) in lighters or small vessels, and delivered direct to ships or stored (photos. 7–9).

The town is on a small peninsula 3 miles from the mouth of the Gülünç Su, formerly walled on three sides and precipitous eastward, with ruined castle and many ancient remains. Water is plentiful and good, from wells, streams, and fountains. There is no surplus produce, except fruit. Labour is supplied from the villages as the seasons permit. There are manganese mines at Kepez (4 miles).

Port. Coaling jetty (9 ft. at head), custom-house, and stone warehouse are on the N. shore of the bay. There are also remains of an ancient mole, and small landing-piers, in front of the town, 2 cables SSW. from the battery. There are facilities for exterminating rats.

Elsewhere also in the neighbourhood, coal is shipped both direct and to Bender-Ereğli:

(1) From the Ereğli mines at Kilimli, 3 miles NE. of Zonguldak bay (p. 55): there is a small jetty, but lighters cannot remain overnight, and are towed back to Bender-Ereğli.

(2) From Kozlu, 3 miles SW. of Zonguldak bay, where there is sheltered summer anchorage NE. of the valley. Prevalent winds are NE., and storms are violent till May; lighters load coal at a small pier.

(3) From Kandilli, 13 miles SW. of Kozlu bay, from mines at Kozlu and at Çamli. There are four small jetties, and in fine weather ships can load coal in the roadstead NE. of the valley, from barges and small craft (photos. 32, 33).

Communications. In 1935 a modern port was planned for Bender-Ereğli, with coastal railway to Zonguldak. The railway is unfinished (1942), but through Devrek on the Zonguldak–Gerede motor-road there is access at Reşadiye to the Bolu–Gerede section of the Istanbul–Ankara highway. Bender-Ereğli therefore serves a wide region inland, with abundant timber, largely unexploited, as well as the coastal trade in coal.

BULANCAK (Bulancik, Pulandjak, Akköy). 40° 50′ N., 38° 15′ E. Giresun vil.: kaza. Pop. 4,400.

A small port 10 miles W. of Giresun and W. of C. St. Basili, on Bulancak R., whose flat valley occupies 3 miles of the coast. Low wooded hills rise behind. It is on the Samsun–Rize coast road.

[1] The anchorage is obstructed by 20 ships sunk by the Russians during the War of 1914–18, and by 2 out of 11 ships which grounded during a gale in 1939. Eight of the sunken vessels are to be refloated or destroyed (1940).

CIDE (Jidde, Jiddeh, Karaağaç; *class.* Aegialis). 41° 54′ N., 32° 59′ E. Kastamonu vil.: kaza. Pop. 1,750.

Cide lies 14 miles W. of Kerempe Burun and 2½ miles N. of the conical Fulo Tepe. It was formerly a shipbuilding port, but now handles only a little trade. The moderate anchorage (13 fathoms, mud, or 3 fathoms inshore, sand) is protected from E. winds by the bluff Karaağaç (Köpekkayasi) point; it is exposed to N. and W. winds, and is only used by coasting-craft. Motor-road to Kastamonu.

EREĞLI. *See* BENDER-EREĞLI.

FATSA (Fatza, Fatisa, Fatseh; *class.* Polemonium, Side, Phadisana). 41° 01′ N., 37° 29′ E. Ordu vil.: kaza. Pop. 2,900. Agricultural bank.

The picturesque town lies E. of the Kirmizi (Elekçi, *class.* Sidenus) stream, in the SW. corner of Fatsa bay, between C. Yasun and Kireççik point, with wooded hills inland. There is a Byzantine citadel, monastery, and other ruins; and a conspicuous mosque in the middle of the town. Nuts, eggs, and poultry are exported.

Port. Fatsa bay is deep but exposed to N. winds. A visible reef 6 cables long, with 12 fathoms to N., projects from Kireççik point, and the ancient breakwater (500 yds.), which curves out to a small island, connects this reef with the W. shore. Landing is mostly on the open beach, though there is a dilapidated landing-stage.

Communications. Fatsa is connected with Niksar in the Kelkit valley, by remains of a paved Roman road, over difficult and wooded mountains. There is a coast road, with telegraph, to Ünye and to Ordu.

FILYOS (Filios, Philios, Hisarönü; *class.* Tieum). 41° 37′ N., 32° 02′ E.; alt. 23 ft. (rly. stn.). Zonguldak vil.

The bay is surrounded by low hills and deeply filled with sandy beach. The town, a holiday resort, stands on a cliff-fronted promontory in rolling country. The port is at the mouth of the Yenice (Filyos, *class.* Billaeus) R. (photos. 10, 11).

The anchorage is exposed. The landing-stage is in shallow water. A wooden jetty 134 yards long, built in 1927–8 to unload material for the railway, was destroyed by the sea. A reinforced-concrete pier (1938, 490 ft.) with 8–9 feet at head has two railway tracks and coaling facilities. The eastern entrance to the river is 6–7 feet deep, for 3 cables upstream; the western is shallower. The port only

handles light traffic for Karabük and Ankara, but could be improved (I, photo. 5, p. 41).

Communications. Railway to Zonguldak, and by Çankiri to Ankara (Railway 11). There is a rough track along the coast to Zonguldak and another inland branching to Bartin and to Devrek.

GERZE (Gherzeh, Gherseh; *class.* Carusa). 41 °46′ N., 35° 13′ E. Sinop vil.: kaza. Pop. 3,550.

The town is on a low promontory backed by high mountains, about 5 miles NW. of Kurzubet point, from which a reef extends to within ½ cable of Gerze.

Exports, mainly to Istanbul, include corn, fruit, tobacco, and timber.

The harbour is protected by the narrow promontory from W. winds and to some extent from N. Anchorage in roadstead 5 cables off shore, in 5–7 fathoms, is said to be safe. Small vessels can anchor 2 cables S. of the town in 3 fathoms, sheltered from N. winds.

Motor-road to Sinop and Samsun, with branch to Boyabat.

GIRESUN (Gireson, Kerasunt, Kerasunda; *class.* Choerades, later Pharnacia, and Cerasus). 40° 51′ N., 38° 24′ E. Vil. cap. Pop. 13,950. Ottoman, Iş, and Agricultural banks. Bourse. Meteorological station. Electricity station (medium).

The town, 11 miles W. of C. Zefre (Çam point), occupies the slopes of a rugged volcanic promontory (425 ft.) connected by a low wooded isthmus with the main range: on the summit is the towered Byzantine fortress, whence walls extend down the slopes on both sides (I, photo. 12, p. 46).

Giresun was a Greek colony, Cerasus, whence the first cherries (*Arm.* keraz) were brought to Rome by Lucullus. The wild cherry is abundant in the district. The Christian population has been removed, but a church still stands N. of the cove; the mosque is on the S. side. The town suffered severely from earthquake in 1939. There was a shipbuilding yard here, which was destroyed by the Russians in 1915. The district produces the best hazel-nuts, and Giresun is the centre of this trade; other exports are corn, walnuts, fish-oil, paint, leather, eggs, poultry, and rock alum which is mined inland at Şebinkarahisar.

Port. Palamida rock (2½ ft. high) is ½ mile NE. of the promontory, with the Kiostum reef inshore (least depth 5 ft.). From the NW.

end of the promontory an ancient mole forms a reef for 1½ cables to W. Small vessels can anchor here. There is a wharf in the small cove 4 cables S. of the light-mast. Anchorages depend on the winds. In good weather, vessels can anchor (*a*) in Lonca bay, W. of Giresun point in 8–10 fathoms, near the landing-place and custom-house, but exposed to W. winds; (*b*) off the Batlama river W. of Lonca, in 20 fathoms; (*c*) in Demirkapu bay E. of the point, in 12–13 fathoms, sheltered from W. to NW. but exposed to N. winds with heavy surf: better anchorage off shore in 16 fathoms; (*d*) in a cove W. of the promontory. Seaward of the town is a wide open front with stone steps where small boats can land in shallow water. The beach is sandy and boats can disembark for a distance of 1 mile to W. (I, photo. 13, p. 46).

The climate is healthy, but malaria is prevalent.

Communications. A road zigzags inland to Şebinkarahisar and the Kelkit valley, where it joins the Sivas–Erzincan highway. There is a regular steamship service to neighbouring ports on the Trabzon–Istanbul route, and an aircraft landing-ground near the shore a mile or two W. of the town.

GÖRELE (Elevi, Elehu; *class.* Philocalia). 41° 02′ N., 38° 59′ E. Giresun vil.: kaza. Pop. 2,100.

Anchorage at the mouth of the Görele stream between C. Zeytin and C. Kara, sheltered from all except N. winds by densely wooded hills behind the small town (alt. *c.* 150 ft.). On Samsun–Rize coast road.

HOPA (Khoppa; *class.* Apsarus?). 41° 25′ N., 41° 24′ E.; alt. *c.* 330 ft. Çoruh vil.: kaza. Pop. 2,900. Electricity station (small).

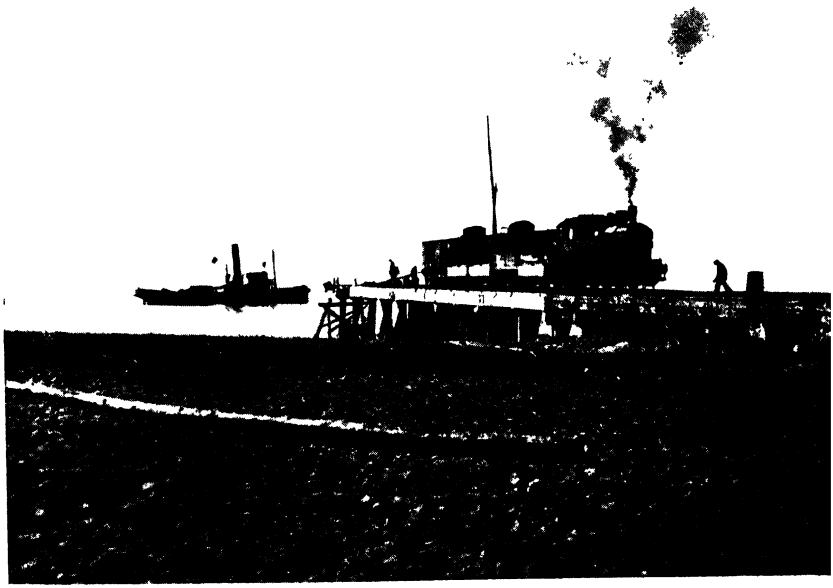
The small port, 9 miles from the Russian frontier, is on the steep W. slope of wooded hills rising to *c.* 1,450 feet, and 1 mile N. of the mouth of a small stream. It exports copper from mines at Kuvarşan and Murgul, walnut-wood, and sheep from Kars.

The open beach is exposed to W. winds. A small metallic construction on screw piles was built in 1938 to serve the Kuvarşan copper-mines. Ships must lie some distance off this small pier, and materials have to be ferried by lighters, which are hauled up on the beach in rough weather.

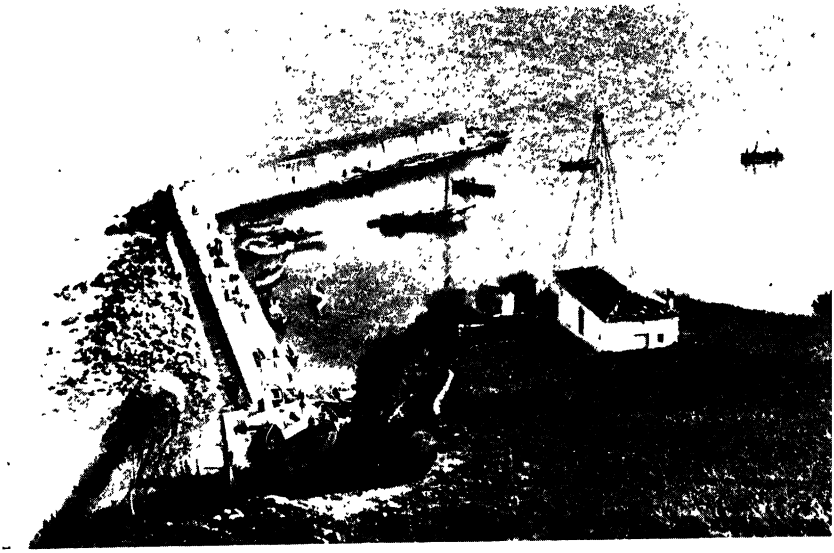
Communications. There are rough coastal motor-roads SW. to Rize via Pazar and NE. to the Russian frontier; a better road leads inland



10. *Filyos pier and beach*



11. *Reinforced concrete pier at Filyos*



12. *Inebolu mole*



13. *Inebolu town and beach*

over a narrow pass to Borçka in the Çoruh valley, whence there is a main road with telegraph to Artvin, with a branch road to Murgul copper-mines. About half the steamers on the Istanbul service call at Hopa.

INCILI. *See* KARASU.

INEBOLU (Ineboli; *class.* Niopolis, Abonutichus, Ionopolis). 41° 58′ N., 33° 46′ E. Kastamonu vil.: kaza. Pop. 5,100. Iş and Agricultural banks. Hotels (3). Electricity station (medium).

The port is SE. of Stefano point at the mouth of the wooded ravine of the Devrihan Çay. The town stands on a low, bluff point, with hills rising to 490 feet to the SW. (I, photos. 3, 4, p. 40).

Trade. This is the port for Kastamonu and an important commercial centre. It trades in eggs, timber, walnuts, fruit, flax, cotton, wool, and mohair. Copper was formerly exported.

Port. There is no regular harbour, but a mole and reef project *c.* 3 cables abreast of the town, giving some shelter to the roadstead to the E., where small craft anchor in 3–4 fathoms. Small boats can land, in 2 feet of water, by a wharf E. of the mole. There is also anchorage both off the town in 3–5 fathoms, sheltered only from NW. winds, and E. of Antonio point, in 3–4 fathoms, but this is exposed to all seaward winds. The usual anchorage, however, is W. of Inebolu point, off the modern commercial quarter of the town, in 10–16 fathoms (photos. 12, 13).

Lighters, which are plentiful, are used. In winter, steamships in the roadstead are sometimes unable to land cargo.

Communications. Motor-road to Kastamonu, and thence to Çankiri and Ankara. Turkish steamers visit the port regularly.

IRIVA (Riva). 41° 13′ N., 29° 12′ E. Istanbul vil.

The small port lies at the mouth of the Iriva R., 1½ miles E. of Yom Burun at the N. entrance to the Bosporus. There is an old fort at the mouth of the river (I, photo. 2, p. 40).

Charcoal and firewood are transported down the Iriva R., which is navigable for large boats into the interior, and are exported to Istanbul. The bar at the mouth of the river is only passable in winter, and the port was built to facilitate transhipment during the summer months. It now records no trade.

There is anchorage in 4 fathoms ½ mile W. of Iriva, but from 1 mile off shore the water shoals rapidly towards the beach.

Communications. A motor-road leads SW. to Beykoz and Üsküdar. Two cart-tracks connect the port with the Beykoz–Şile road. There is a coastal track direct to Şile.

KARASU (Incili, Incirli). 41° 08′ N., 30° 36′ E. Kocaeli vil.: kaza. Pop. 2,100.

A small timber port at the mouth of the Sakarya (*class.* Sangarius) R. Vessels anchor in 10 fathoms, but are exposed to N. winds. There are no facilities. At the bar in the river-mouth, water is only 3–5 feet deep, but for 8 miles inland it is about 3 fathoms deep and 100 yards wide. The rapid current discolours the water to seaward.

MIDYE (Midia, Medea; *class.* Salmydessus). 41° 38′ N., 28° 06′ E.; alt. *c.* 100 ft. Kirklareli vil.

The town is at the mouth of the Pabuç R., on a steep cliff. It exports some local produce. At Midye the preliminary peace terms after the First Balkan War were signed on 30 May 1913 (I, p. 297), surrendering all Turkish territory W. of the 'Midye-Enez' line.

Port. South of the town a creek *c.* 100 yards wide shelters small vessels from N. winds: depth 1½–2 fathoms. Off the town the anchorage is obstructed by rocks.

Communications. Tracks (1) with telegraph over Istranca Dağ to Saray on the Silivri–Kirklareli road, thence to Çerkeşköy on the Istanbul–Edirne railway; (2) to W. up Kazan valley to Vize; (3) to N., to Iğneada.

OF (Off; *class.* Ophius). 40° 57′ N., 40° 18′ E. Trabzon vil.: kaza. Pop. 1,150.

The small roadstead is at the mouth of the Of (Haldizen) R. (*class.* Ophis), with wooded slopes behind. Malaria is prevalent.

Coastal road to Trabzon and to Rize. A roughly paved track follows the ravine inland towards Bayburt; open over the Soğanli Dağ.

ORDU (*class.* Cotyora). 41° 01′ N., 37° 51′ E. Vil. cap. Pop. 10,100. Iş, Agricultural, and Ottoman banks. Hotel. Electricity station (medium).

The town lies 20 miles W. of C. St. Vasili, on the E. slope of Boztepesi promontory, ending NE. in the rocky Büyük Kali point between the Melet and Perşembe beaches. Rock-cut remains of an ancient port are visible. The town suffered severely from earthquake in 1939. Malaria is prevalent.

The port is fifth in importance on the Black Sea coast, and has

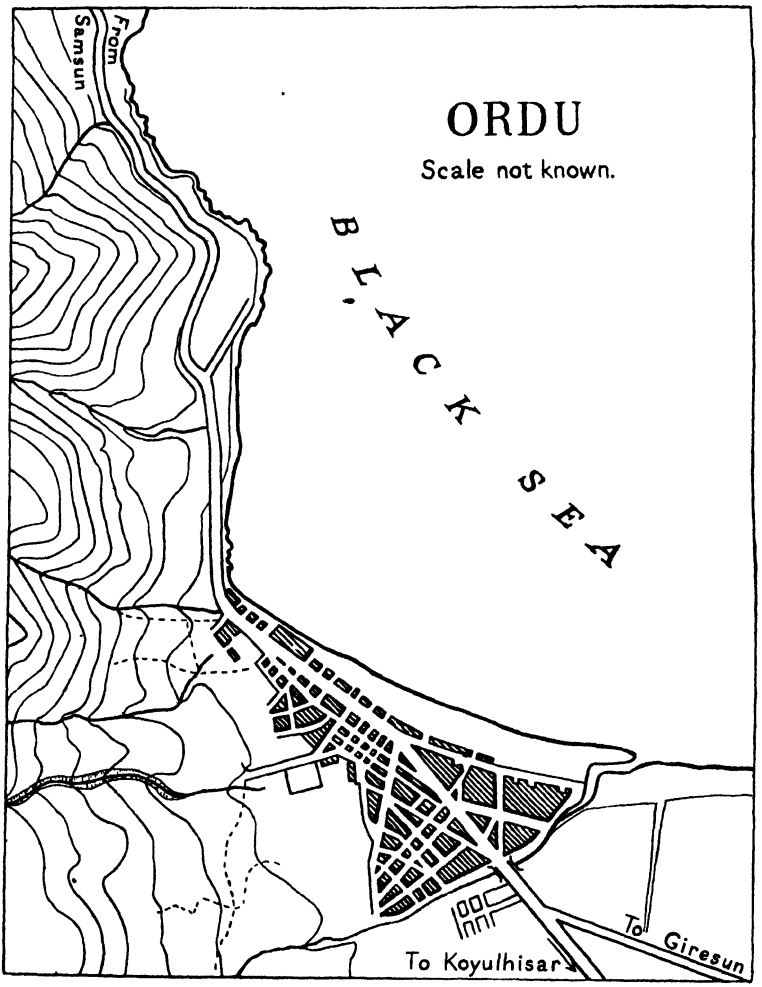


FIG. 10. *Sketch-plan of Ordu*

a large trade in filberts (hazel-nuts), which grow wild abundantly. Eggs and poultry are also exported. There are manganese mines near the town.

Port. There is anchorage in 6–9 fathoms, sand and mud, sheltered from W. by Çam point and Yasun Burun, but exposed to N. and E. and unsafe in bad weather. The S. part of the bay is shallow (4 fathoms at ½ mile off shore), and in N. winds Vona bay, farther W., has more shelter: here many coasting-vessels winter, though land-winds are violent. There is anchorage also off the long beach in Perşembe bay, and off Ağzi, Keşala, or Çeşme.

Communications. Inland motor-road to Koyulhisar (60 miles) for Sivas and Erzincan. In 1940 a motor-road to Samsun and Sinop was nearly completed; another runs eastward to Rize. There is a track to Perşembe.

PAZAR (Kizkalessi, Atina; *class.* Athenae). 41° 11′ N., 40° 53′ E.; alt. *c.* 160 ft. Rize vil.: kaza. Pop. 1,850.

The town lies near the mouth of the Pazar (Atina) R., on the NE. slope of a wooded spur which rises to *c.* 1,320 feet. The castle is on a bold rock. There is a long bazaar, and buildings extend eastwards along the shore. The local language is Laz. Raisins are exported. Russian troops landed at Pazar in 1916.

There is a small wooden landing-stage about 50 yards long with a depth of 2 fathoms at the end.

Communications. Rough motor-roads lead SW. to Rize and NE. to the Russian frontier via Hopa. A roughly paved bridle-path leads up the narrow Pazar valley and crosses the Tatus Dağ to Ispir in the Çoruh valley.

RIZE (*class.* Rhizus, ? Bechirias). 41° 02′ N., 40° 31′ E.; alt. *c.* 300 ft. Vil. cap. Pop. 14,700. Agricultural bank. Hotels (5). Meteorological station. Electricity station (small).

The bay lies between Askoros point and Pirios point, whence the coast is foul to Tower point, half-way to the town. There is anchorage at 3 cables in 5 fathoms and at 1 cable in 3 fathoms, exposed to N. and NW. (I, photo. 11, p. 45). From Askoros R. is a westward current, in summer *c.* ½ knot, in winter perceptible.

The town is on the S. shore of the bay, on both banks of a stream, and on rising ground surrounded by wooded heights. Most houses are of wood, in their own gardens. Vegetation is luxuriant; coastward slopes are covered with olives, oranges, and lemons. Provisions can

be obtained. Main products are citrus fruits, apples, walnuts, hazelnuts, beans, flax, fish, oil, leather, boxwood, and wax, which are exported. Rize was formerly capital of Lazistan, but the bazaar is poor. Scarves and linen goods are woven from flax, grown and bleached locally. Tea is being grown experimentally.

The open sandy beach has no protection. Ships lie off shore; lighters are used for passengers and merchandise, except when prevented by off-shore winds. There is a small landing-pier, and a lighthouse guards the NW. point of the bay. Gales are frequent from December to February, when only the E. part of the bay is safe: here native sailing-vessels winter.

Climate. Mild, wet, and cloudy, but reputed healthier than much of this coast. Winters fairly warm and very wet; summers wet and fairly hot. Rainfall 105 inches. Malaria severe, but Rize is a summer resort.

Communications. There is a rough motor-road, which is being improved, to Trabzon and to Batum (partly paved to Azapar Dere), with telegraph to Trabzon and to the international boundary. The only roads inland are from Batum, for the coast ranges are steep, lofty, and almost continuous. A poor motor-road or cart-road crosses the Kara R. southward to the Iyidere valley, then ascends SE. into mountains.

Turkish mail-steamers call regularly.

SAMSUN (*class.* Amisus). 41° 17′ N., 36° 20′ E.; alt. 7 ft. (rly. stn.). Vil. cap. Pop. 36,900 (1940). Iş, Agricultural, and Ottoman banks. Hospital, barracks, meteorological station (alt. 26 ft.). Malaria commission centre. Bourse. Hotels (7). Roman Catholic church. Standard oil-tanks. American tobacco firms. Electricity station (medium).

Site. Town and anchorage lie between Kalyon point on N. and Derbent point on SE., on W. shore of open bay between Yeşil Irmak delta and steep spurs of coast range behind Kalyon point (I, photos. 7, 8, 9, p. 44).

History. Samsun developed as commercial centre of Black Sea coast, second only to Trabzon; and terminus of route from Baghdad, with hinterland trade as far as Sivas, Kayseri, and Yozgat; serving also nearer lowlands of Çarşamba, Amasya, and Tokat. Many rock-cut tombs in hill-sides attest former wealth. Along the ancient Samsun–Trabzon trade-route, Christian civilization spread to Armenia, the

Caucasus, and Russia. The old town stood on the promontory 1½ miles NW. of its modern quarters in a strong position, protected by the sea to NE. and deep Görtün valley to W. A silted depression and gardens between lighthouse and Bafra road marks the old port. The modern town is in three quarters, facing NE., with better houses on steep slopes inland. Business and European quarters, well laid out, are near Government offices in E. The old streets are narrow, with a large covered bazaar.

Trade. The town is surrounded by extensive olive-groves and tobacco plantations. Exports include tobacco, cereals and flour, timber, wax, eggs, apples from Amasya, wool, skins, copper goods, antimony from Turhal, and oriental antiques. Imports include textiles, metals, and hardware. There are saw-mills, and small tobacco and ice factories. Trade has suffered since the Ankara railway tapped the hinterland.

Port. The bay has temporary summer anchorage for a large fleet, but is exposed to winds from NW. to ESE., and has heavy swell: N. winds are prevalent, and NE. winds dangerous at all seasons, bringing rain, hail, and snow in winter; SW. gales are short but violent. In summer ships anchor at ¾ mile off shore in 6 fathoms, but in winter at 1½ miles. Reefs extend 2½ cables off Kalyon point, and there are rocks in front of the town; southward the coast is clear.

Cargo is transferred in lighters and carted to the railway. The customs pier is 490 feet long, and there are other jetties taking 4–25 tons, with several cranes, but only 6 feet depth alongside (photo. 14). Goods have to be carted or handled from these jetties to the railway running at right angles. There is a British project (1939: £1,500,000) for a port to accommodate vessels of 8,000 tons d.w. Besides lighters there are tugs, motor-barges, lifeboat, throwing-line apparatus, and refuge-station (*tahlisiye*). Near the custom-house are warehouses, corn-stores, and petroleum store (tins only). The port is equipped to exterminate rats.

Climate. Warm, damp, and cloudy. Autumn is the best season: winter and spring are rainy and mild with fog; lowest m.d. min. 44° F. Summer, hot (highest m.d. max. 84°) with some rain and morning land-haze up to 1,000 feet. Rainfall 28 inches. Malaria is common; typhus epidemic in 1923. Water plentiful and good.

Communications. Railway (normal gauge) by Amasya to Sivas (Railway 12); narrow-gauge line (750 mm.) E. to Çarşamba. Coastal motor-road to Rize and to Sinop; inland motor-road by Kavak to Merzifon for Çorum and Ankara, and to Amasya and Erbaa.



19. *The walls of Trabzon*



Regular port of call on Istanbul steamer service.

Seaplane base (reported); landing-ground, 41° 15′ N., 36° 25′ E. Telegraph to Istanbul and Sivas.

ŞILE (Schile, Chile, Kilia; *class.* Artane). 41° 11′ N., 29° 37′ E.; alt. *c.* 150 ft. Istanbul vil.: kaza. Pop. 1,750.

The port is *c.* 2 miles E. of the mouth of the Ulu R. (*class.* Artanes) in a bay backed by wooded country and on the W. by sandhills. The town is on a promontory which ends seawards in a chain of rocks and islets, the largest being crowned by an old square tower. The town contains a minaret 196 feet high. Lighters and fishing-craft are built.

A few ships can anchor in the bay, which is sheltered from SW. winds but exposed to the prevailing NE. winds. The port is of minor importance with no facilities except a wooden pier 120 feet long, 20 feet wide, with a concrete end, and 10 feet of water alongside. Northerly winds hinder and may prevent use of lighters. A pier taking ships up to 3,000 tons is planned. There is flat land near the pier for a dumping-ground.

There is a motor-road to Agva, to Üsküdar (via Ömerli), and to Beykoz. A coastal track leads to Iriva village. There is an airfield used by the Istanbul–Ankara service.

SINOP (Sinob, Sinub; *class.* Sinope). 42° 01′ N., 35° 11′ E.; alt. 66 ft. Vil. cap. Pop. 4,850. Electricity station (small).

The only safe roadstead between the Bosporus and Batum; and though secluded by rugged mountains, the earliest northern port for Anatolia and caravan traffic from the Euphrates; later superseded commercially by Samsun.

Site. The deep bight E. of C. Bafra is further sheltered from W. by the bluff flat-topped Boz Tepe (700 ft.), an inshore island on which stands the medieval fortress, washed by the sea, now a civil prison, joined to the continent by a sandy isthmus. The town is on the landward slope of the Boz Tepe peninsula, but the older Moslem quarter was within the walls, and modern suburbs, formerly Greek, line the beach landwards, and cover the isthmus. Inland, steep wooded mountains shelter the bay for 20 miles to SE.

History. Sinope was founded by Greeks from Miletus *c.* 750 B.C., and had trade with the Phrygian bazaar-city Pteria on the plateau. Later it was outrun by Amisus (Samsun); repeatedly attacked by

kings of Pontus, whose capital it became (183 B.C.); the Romans (A.D. 70) made it the centre of their province of Pontus. Later it was superseded by Trebizond (Trabzon), but replaced it as capital of the Trebizond kingdom after A.D. 1200. The Seljuks took it in 1214, and the Ottoman Turks in 1460. It was destroyed in 1853, and has not recovered. The town was the birthplace of Diogenes the Cynic.

Trade. Local produce includes fruit, vegetables, nuts, eggs, livestock, and fish. A caviare factory was planned in 1938.

Port. The roadstead, S. of Boz Tepe and the isthmus, is safe even in winter, in all but S. winds. Anchorage is good, in 5–10 fathoms, 2 cables S. of the town: but there is a steep-to rock 2 cables NE. of Boz Tepe point, and off the town; ½ cable off shore, the bottom within 3 fathoms is foul with remains of harbour works. The jetty (26 ft.) and customs quay (100 ft.) west of it have 3 feet of water alongside. Accommodation is dilapidated, with a few small warehouses. There is a landing-place S. of the peninsula, at the ravine with beach below Adaköy.

The port serves as a transhipment depot from coastal craft to larger ships; and was a petrol depot for submarines 1914–18. Facilities for exterminating rats are reported.

Climate. The climate is mild and wet in winter, fairly hot in summer, with some rain (28 in. annual). Winds from NW., E., and SE. are commonest; those from N. and NW. are dangerous. Fog is most frequent in May. There is much malaria, from marshes.

Communications. Coast road through Bafra to Samsun: inland dry-weather road to Boyabat; motor-road E. from Boyabat to Havza on Samsun–Sivas railway, thence to Amasya, and W. from Boyabat to Kastamonu; track W. to Inebolu. But transit facilities are poor and restricted for so good a port.

SÜRMENE (Surmena; *class.* Susurmaena). 40° 56′ N., 40° 04′ E. Trabzon vil.: kaza. Pop. 3,300.

The town, formerly a Roman garrison and fort, lies W. of the Kara Dere, in an open bay between C. Arakli (W.) and Pirios point (E.). The climate is warm and damp; malaria common; typhus epidemic in 1923. Trade in porpoise oil with Trabzon.

The bay is deep, but to westward is temporary anchorage in 20 fathoms. Landing is possible in fine weather on the beach, which is over a mile long and exposed to N. winds. The landing-stage built by the Russians is now 100–200 yards inland as the result of N. gales which have silted up the beach.

There is a coast road to Trabzon and to Rize with ferry over the river when in flood, and a track up the Kara Dere leading SW. to Gümüşane and SE. to Bayburt.

TERME. 41° 12′ N., 36° 57′ E.; alt. *c.* 50 ft. Samsun vil.: kaza. Pop. 2,700.

This small port is on the left bank of Terme stream (*class.* Thermodon) about 1½ miles from W. shore of a wide bay formed by the Yeşil Irmak delta and Ünye promontory. Many houses are of wood. Malaria is common owing to delta marshes to NW. Anchorage in 4–5 fathoms off Terme river, 3½ miles S. of Çalti point, protected from NW. winds. Small vessels sail up river for rice and other grain.

Coastal motor-road to Sinop; route E. to Ordu probably fit for light motors since streams were bridged (1941).

TIREBOLU (Tireboli, Tarablus; *class.* Tripolis). 41° 01′ N., 38° 49′ E. Giresun vil.: kaza. Pop. 4,000.

The town lies 5½ miles W. of Kara point and 3 miles W. of the Harşit R. mouth. Three small rocky headlands enclose two coves, below the seaward foot of Sys Dağ. Woods surround the site and extend E. along the coast hills. The town, of Greek origin, has medieval churches, four mosques, with conspicuous minarets, a medieval castle and forts on the headlands, a bath, and other public buildings.

Local produce is plentiful; exports are nuts, fruit, leather, and eggs. About 2½ miles E. are disused mines of copper, silver, and other ores (*class.* Argyria, 'silver-town').

Port. The bays have deep water, but submerged rocks make anchorage unsafe. In the E. cove about 6 coasters can anchor, in 3 fathoms, but exposed to N. winds. There is anchorage NE. of the town off Halkavala beach in 6–8 fathoms.

Communications. A coastal motor-road runs W. to Giresun and E. to Trabzon. There is a rough track S. into the coast hills, and a little-known road, said to be convertible into a motor-road, up the Harşit valley to Torul.

TRABZON (*class.* Trapezus; *Engl.* Trebizond). 41° 01′ N., 39° 46′ E.; alt. 92 ft. (met. station). Vil. cap. Pop. 33,050 (1940), growing rapidly. Iş and Agricultural banks. British consulate. Barracks. Hospital. Hotels (6). Garages, repair shops. Chief port for Erzurum, and chief outlet for trade with Kurdistan, Iraq, and

Persia, decreased since railway from Ankara and Sivas reached Erzurum; still the second Black Sea port of Turkey, after Samsun, with motor-lorry traffic and occasional caravans from Persia, but Batum, with railway to Erivan and Tabriz, is an active rival.

The bay opens NE. and is sheltered from NW. by Güzelhisar point, which has rocks for ½ cable to N. and a quay projecting NNE. 350 feet with an arm to E. (70 ft.). Within the bay is a beach, and another at Eleüsa point, bordering the Değirmen R. (I, photos. 14, 15, p. 47).

History. Trebizond was a Greek colony of Sinope (Sinob, *c.* 700 B.C.) which prospered long under Rome and Byzantium. From A.D. 1204 it was the capital of an independent dominion from the Phasis R. to the Kizil Irmak (Halys) till Mohammed II took it in 1461. In 1914 it was the main sea-base of supply for the Turkish forces, but was taken by the Russians in 1916 and retaken in 1918. In 1939 it suffered severely from earthquake. Its former Greek and Armenian inhabitants have disappeared, but there is still a Persian colony of traders and silversmiths.

The ancient city lay on and around the dome-like Boz Tepe (800 ft.) which gave its name (Trapezus—'Table Mountain'), and is defended by deep ravines spanned by old fortified bridges and filled with gardens. Here are Byzantine castle and walls, Genoese and Venetian remains, thirteenth-century church, and mosque (photos. 17, 19). The medieval and modern town occupies the adjoining hill on either hand (photo. 20). Old, well-built houses lie within the medieval walls, at the foot of which are the remains of an ancient port; the foreign and business quarters, with gardens and trees, lie on the promontory and E. towards Değirmen Dere, where the Erzurum motor-road leaves the coast; most houses have one story, with red tile roofs. The old Moslem quarter extends W. towards S. Sofia mosque, which lies about 2 miles out from the walled town. The Orta Hisar and Yeni Cuma mosques were originally churches, the cathedral church of the Golden-headed Virgin (Krysokephalos) and the church of S. Eugenios.

Trade. The district is densely wooded, but industriously cultivated by the villagers. Much maize is grown, but other cereals have to be imported. Provisions are plentiful.

Local exports are hazel-nuts, tobacco, beans, linseed, cereals, fruit (especially apples from Gümüşane), livestock (sheep and cattle from Erzurum), wool, cotton from Iğdir, skins, eggs, butter, wax, tallow, fish-oil, boxwood, silver filigree work (by local and Persian workmen),

alum, lead, and copper from mines inland; copper is also worked for domestic use. Saw-mills cut timber for shipbuilding, house-construction, firewood, and charcoal. There is usually a small stock of Turkish coal and of oil-fuel. There is an abattoir and an ice factory; works for canning and salting fish and making fish-meal are planned.

Imports are cotton and woollen goods, leather, hardware, and metals.

Port. The harbour is E. of the town, open to NE., with heavy swell also in NW. and W. winds, and strong gusts of land-wind at night from the coast range (7,000 ft.). Anchorage E. of Güzelhisar point, in 5 fathoms; and for small craft under lee of Güzelhisar mole. In rough weather local boats can be beached S. of the custom-house. The bottom shelves steeply from 6 fathoms at 550 yards off shore to 8 fathoms at 660 yards: in heavy weather waves break in 6 fathoms. During strong winds steamers anchor farther off shore, or shelter 8 miles W. at Akçaabat. Large vessels shelter at Sinop.

Quayage. There are no deep-water quays, but a breakwater 130 feet long E. from Güzelhisar point. Inshore is a vertical wall with 4–5 feet of water alongside. A quay wall follows the shore-line for *c.* 490 feet S. with 3–4 feet alongside, and two small jetties 230 feet and 130 feet long, both about 30 feet wide, lightly built for small loads only, with 6 feet depth at head.

About 800 yards E. are ruined breakwater and wharf built by the Russians in 1916, and 440 yards farther E. another Russian jetty 260 feet long, 66 feet broad, with 9 feet depth at head, but too far from the town for commercial use. Seven other jetties take up to 30–50 tons.

Equipment. There are a few cranes, but no facilities for watering ships. Many small boats lie on the shelving beach; and lighters and barges are available. The port is equipped to exterminate rats.

Storage. Warehouse-storage is fairly good: customs warehouse behind the quay (capacity 300 tons); transit (Teheran-road) warehouse (500 tons); port warehouse (in the town: 250 tons); also open storage ground (43,000 sq. ft.), of which 5,400 square feet is roofed.

Climate. Winter is mild and summer warm; both are damp. Prevalent winds are from N. and NW., brief and violent with heavy seas. The season opens late and is changeable, the sky usually cloudy; grapes and figs do not ripen before October. The climate is healthy; epidemics are rare, but there is much malaria, especially in summer, and in the lower parts of the town. Water is good and plentiful except in summer.

Communications. There are coast roads E. to Rize and Batum; W. to Giresun, with the next avenue inland, and Samsun. By the

Değirmen Dere the trunk motor-road (*Transit-yol*) goes SW. by Gümüşane to Bayburt and Erzurum (110 miles; lorry-service closed in winter); but lack of transverse valleys limits intercourse.

Weekly steamer to Istanbul, and smaller coasting services. Seaplane bases and facilities for building seaplanes (reported); an unmade landing-ground is E. of the town on the 'Campos'.

ÜNYE (Unie, Onieh, Ünia; *class.* Oenoe). 41° 07′ N., 37° 18′ E. Ordu vil.: kaza. Pop. 5,800. Electricity station (small).

The town lies 17 miles W. of C. Yasun on converging slopes of the flat-topped Taşkara promontory, which protects Ünye bay from NW. and W. winds (I, photo. 10, p. 45). Inland the sharp peak of Mozen Dağ (2,330 ft.) overlooks the Yeşil Irmak valley. The coast ranges are well wooded. The only trace of antiquity is a ruined church on an inshore rock off Taşkara point. Most of the houses are of wood, some on piles over the sea. There are handsome white two-storied buildings and a mosque.

Trade. Ünye is the outlet for the Sivas region, and exports agricultural products, nuts, wool, and leather, to Istanbul and the Crimea.

Port. Anchorage is abreast of the town at 7 cables off shore, in 5–6 fathoms, sheltered from NW. and W., but dangerous in rough weather, especially in NE. winds. The bottom shelves gently. There is a small pier near the custom-house, but landing is usually on the sandy open beach.

Communications. A motor-road leads over the mountains to Niksar in the Kelkit valley. The Samsun–Rize coast-road passes through.

VAKFIKEBIR (Fol Bazar, Büyükliman; *class.* Cerasus). 41° 02′ N., 39° 17′ E. Trabzon vil.: kaza. Pop. 1,200. 1 hotel. Agricultural bank.

Local produce includes hazel-nuts, beans, eggs, and butter.

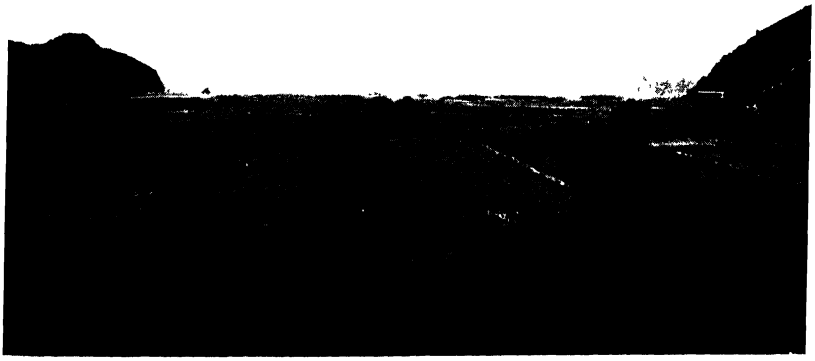
The bay between C. Yeros, a bold volcanic promontory, on the E. and Zeytin point to W. is sheltered from all winds except N. and NW. There is good anchorage off the Fol (Çeşme, *anc.* Cerasus) river.

ZONGULDAK (Songuldak, Zunguldak). 41° 29′ N., 31° 49′ E.; alt. 33 ft. (rly. stn.). Vil. cap. Pop. 37,400 (1940). Hotels (10). Prison, barracks, military hospital. Small garages and repair shops. Electricity station (medium).

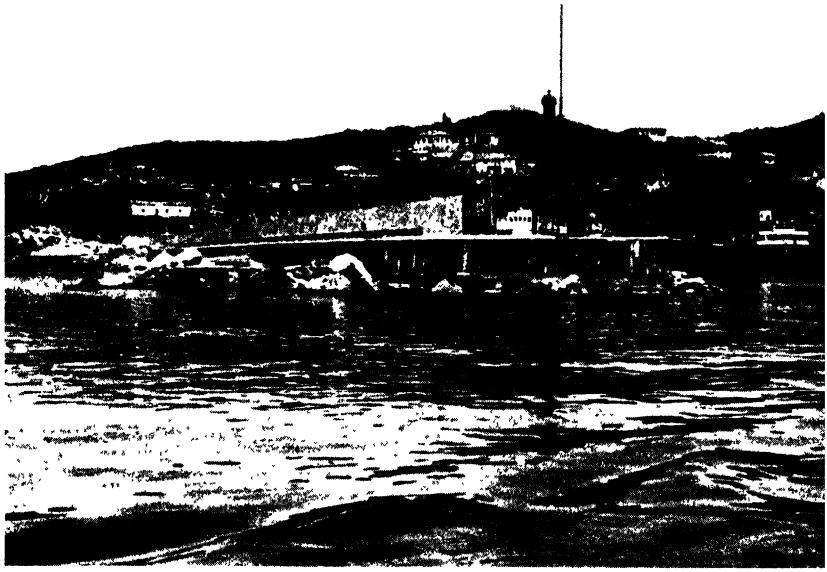
Zonguldak bay, the principal port for the Ereğli coal-field and Karabük steel-works, is surrounded by white cliffs but is open to



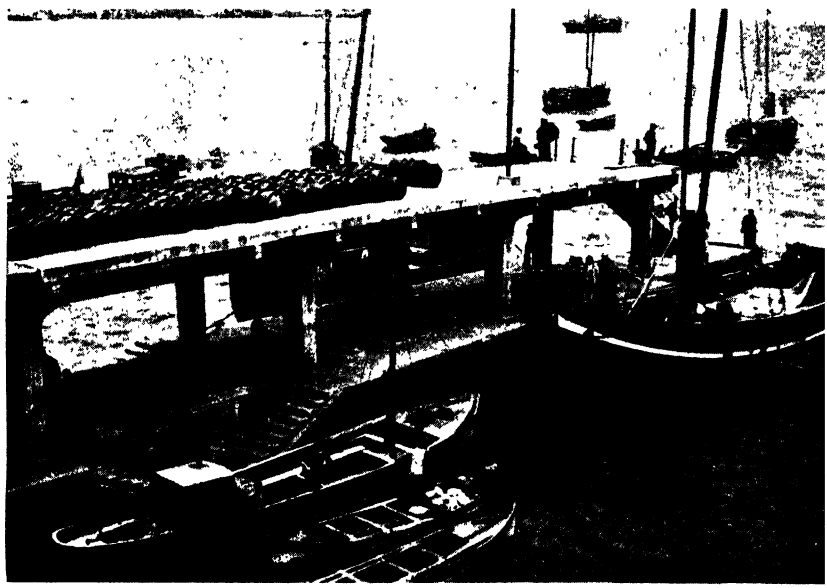
21. *Çatalağzi, from the sea*



22. *Çatalağzi gap from the land*



23. *Zonguldak. The Breakwater*



24. *Zonguldak. The Lighter Pier*

N. and to W. and exposed to NW. and NE., whence come the worst winds. The Üzülmez R., issuing from a ravine in the coast range, and joined by a smaller stream from SE., deposits much silt, and constant dredging is necessary. The town lies on shore-deposits and hill-sides E. of the river-mouth and extends N. to the harbour, with a suburb S. of the river. It is mean and ill-equipped; has no industries except a little boat-building from local timber, a foundry, coke-ovens, an ice-factory, and an electricity station; chemical works are planned, and another powerful electricity station was contracted for in 1940 at Çatalağzi, along the coast to the E. Another large new electricity station is at Kozlu, 5 miles SW. Workmen in the port and neighbouring coal-mines are liable to return to the villages for sowing and harvest. Miners are trained in the collieries. A comprehensive British scheme of port development (1938) is postponed, as is the projected harbour at the Çatalağzi gap, 7 miles east of Zonguldak (photos 21, 22).

Water from wells, streams, and fountains is plentiful and fit to drink. Local produce is not abundant, except fresh fruit in summer. Malaria is prevalent, and there was a typhus epidemic in 1923.

Port. Zonguldak is essentially a coal port (1,500,000 tons yearly, mostly for Istanbul). There is anchorage in 13 fathoms and breakwater, 984 ft. long, forming a small harbour (photos. 23, 24). Entrance and exit are difficult owing to shoals. Two ships can berth inside the breakwater where coal is delivered by metre-gauge railway from local mines and from Üzülmez (10 miles). There are two steam cranes on the breakwater. Coal is also brought in barges direct to the ships, from the mines at Kozlu. Gravel ballast is transferred in lighters to a small jetty. Pit-props are landed on the open beach W. of the harbour. In rough weather coaling is interrupted, and vessels have been lost even within the port. There are facilities for exterminating rats. Several fairly sheltered beaches within 2 miles E. with a boat-building slip on one of them. A 1940 report stated that the port was unusable because of silting.

Communications. Railway by Filyos to Karabük, Çankiri, and Ankara (Railway 11). The railway emerges from a long tunnel, and the terminus and goods yard are sheltered in a side valley of the river and connected with the town by a bridge. There are repair shops. The railway is being extended (1942) to Ereğli and has reached Kozlu. There are roads to Kozlu and Bender-Ereğli; but lorries and motor-cars are few, and repair shops inadequate. Difficult road over mountains to Devrek and thence to Bolu–Gerede road and Ankara.

PORTS OF THE STRAITS

BANDIRMA (Banderma, Panderma, *class.* Panormus). 40° 21′ N., 27° 58′ E.; alt. *c.* 125 ft. Balikesir vil.: kaza. Pop. 13,300. Agricultural and Ottoman banks. Hotels (4). Barracks. Meteorological station. Electricity station (medium).

The Gulf of Bandirma opens NE. into the Sea of Marmara and is sheltered on NW. by Erdek peninsula. The town is on the SE. shore. Water is plentiful locally but slightly salt; perennial supply of good water comes by pipe from Magrurdağ on Erdek peninsula: there is storage (650 tons or 146,000 gals.) W. of the town, and drinking-water at the railway station (fig. 11).

Bandirma is a principal port for traffic between Istanbul and W. Anatolia and was important in the War of Independence (I, pp. 315–16, 318). It was rebuilt after fire in 1874 with straight wide streets (bordered with trees), oblique to the frontage, and a large square by the Haydar Çavuş mosque. The houses are well built. The former Christian quarter lies on higher ground to NE.

Trade. The neighbourhood with its vineyards, orchards, and gardens was formerly productive and prosperous. Removal of Greeks and Armenians diminished its population and activity; but it still exports cereals, flax, dried fruit, olive-oil, beans, fish, eggs, poultry, honey, and much cattle from Balikesir district (49,263 head in 1936), besides borax, mined near Susiğirlik (Susurluk), 40 miles to S. There are stone quarries, cement works, a glass factory, a medium-sized electricity station; a State sugar factory is planned. Fuel and timber are obtained from Kapi Dağ and from high ground S. of Manyas Göl and Mustafa Kemalpaşa. Some malaria occurs in summer, and more on Kapi Dağ isthmus.

Port. The anchorage (11 fathoms) is sheltered on E. by high ground above the town, but has heavy swell in NE. winds, and some current. The port is formed by a mole (820 ft.) at the N. end of the frontage in 7–10 fathoms, without equipment. There is one stone pier (300 ft.) connected by rail with the terminus, and a wooden landing-stage (50 ft.) farther S., but loading and unloading are usually carried out by lighters. A new pier (650 ft.) was being constructed with right-angle extension (260 ft.), and 27 feet of water at seaward end (completion expected by April 1942). West of the town is a wharf (328 ft. long, but only 3 ft. of water) with railway alongside; stores and warehouses along

sea-front of town, and large open shed on railway wharf. Unskilled labour and port labourers are plentiful: carpenters and quarrymen can be found.

Communications. A State railway connects Bandirma, through Balikesir, with Izmir and the S., and with Kütahya for Eskişehir, Ankara, and Konya.

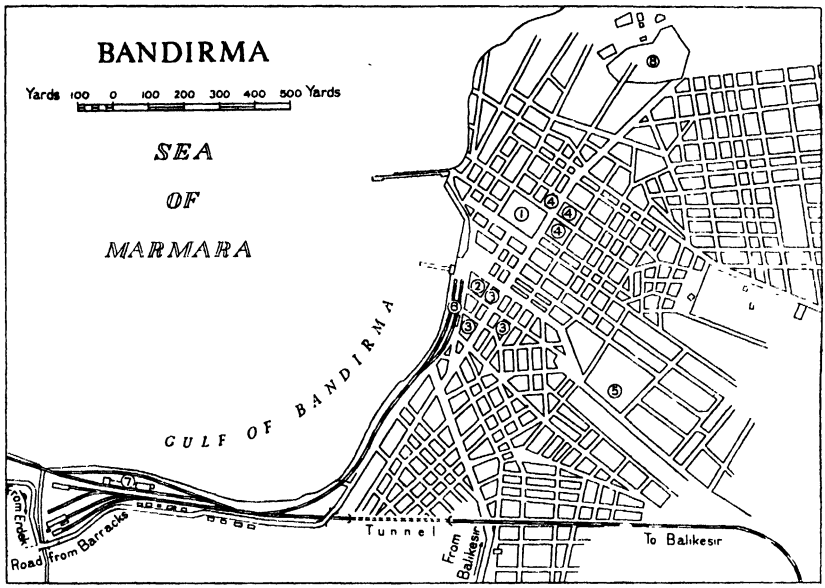


FIG. 11. *Plan of Bandirma*: (1) *Government buildings*, (2) *Mosque*, (3) *Hotels*, (4) *Barracks*, (5) *Motor transport park*, (6) *Town railway station*, (7) *Goods station*, (8) *Cemetery*.

Through a short tunnel the railway arrives at a terminus on the shore SW. of the town, with sidings, engine sheds, repair shops, wharf, and coal store: a single track serves a town station on the sea-front. A rough motor-road connects Bandirma through Karacabey with Bursa and Mudanya, with a branch to Mustafa Kemalpaşa; a good motor-road leads SSE. to Susiğirlik for Balikesir and the S., with tracks branching to Manyas round both sides of Manyas Göl; two short roads lead NE. to Erdek and E. to Edincik, whence a dry-weather motor-road connects through Gönan with the tracks to Balya and Biğa, for Çanakkale, Bayramiç, or Edremit; but there is little transport. In normal times there is a daily steamer to Istanbul, alternative to the long railway route.

ÇANAKKALE (Chanak, Kale-Sultanie; *nautical*, Dardanelles). 40° 09′ N., 26° 24′ E.; alt. 65 ft. Vil. cap. Pop. 11,500. Agricultural bank. Hotels (4). Barracks. Military hospital. Electricity station (medium). Meteorological station. British consular officer.

The town lies on the Asiatic shore of the Dardanelles, facing Kilid-ülbahir, and S. of the Narrows, on alluvial ground NE. of the mouth of the Koca R. (*class.* Rhodius), which becomes a torrent in winter and is crossed by a bridge upstream. Çanakkale, which takes its name from the massive fort built by Mohammed II in 1470, is on level ground N. of the fort, with water-front on Dardan bay. Inland the cultivated plain extends 3 miles E. to wooded hills (1,500 ft.) which overlook both sides of the Dardan valley. N. of Dardan bay, low hills reach the coast above the Mecidiye earthwork battery, and form the low point N. of this, on which is the ruined fort Köse Kalesi.

The town is well built and clean, with some broad straight streets, but also narrow and congested alleys. There are barracks for infantry and heavy artillery, and a military hospital. A hospital is projected.

Water is plentiful and good: (*a*) pumped from wells into reservoirs and filtering station, and thence to the N. pier (4); (*b*) from Karavira spring by 2-inch pipe-line to new barracks and hospital, inadequate.

Trade. Çanakkale is the shipping-control and quarantine station for vessels passing through the Straits for Turkish ports.

Provisions are plentiful. Local produce includes cereals, valonia, olives, canary seed, liquorice, timber, and firewood; wine, *kaşer* cheese, and fish; hides, skins, and furs; wool, cotton, and minerals. There are tanneries, but the painted pottery famous in the seventeenth and eighteenth centuries is now of little interest and in small demand. There is a flour-mill N. of the town.

Imports include sugar, coffee, rice; hardware, machinery, cottons and woollens; leather, fruit, coal, chemicals, salt fish, and canned provisions. Unskilled labour is available, except during sowing and harvest.

Port. The anchorage, in Dardan bay, is sheltered from the E. but is obstructed by inshore banks; there is better anchorage in Sari Siglar bay, 1½ miles S. of the fort, in 10–13 fathoms, and in other bights farther SW. There are no tides, but the water-level is sometimes raised 2 feet by strong S. winds. The current through the Dardanelles is variable. On the bay shore are the custom-house, signal station, quarantine for vessels passing the Straits, and principal agencies. There are four piers: but (2) and (3) are of little use.

(1) The southern (naval) pier (75 ft.) has 20 feet alongside, decauville track (150 tons coal p.d.), and water-supply; local mail boats discharge at the pier-head; other ships anchor 500 yards off shore and discharge into lighters.
(2) Customs pier, length 102 feet with 13½ feet alongside.
(3) Maydos pier, length 148 feet with 7 feet alongside.
(4) General's pier, length 167 feet with 6 feet alongside, and water-supply.

Climate. Mild, wet winters; hot, dry summers; rainfall 20 inches; prevailing NE. and SW. winds, with occasional fog. Malaria is prevalent.

Communications. There are roads N. along the coast to Lapseki (Lampsacus); E. a good motor-road up the Koca valley to Çan for Biğa, Bandirma, and Balikesir; S. through Erenköy and Ezine to Bayramiç, with a branch to Kumkale.

DERINCE (Derinji, Derinhiye). 40° 45′ N., 29° 49′ E.; alt. 20 ft. (rly. stn.). Kocaeli vil.

The port is 5 miles W. of Izmit, on the N. coast of the gulf. There is no town, and only a few railway offices. Drinking-water is plentiful and good, mainly from streams. There are no provisions. Labour is supplied from Istanbul.

Trade. Before Haydarpaşa was built, Derince was the main port for exports and imports of the parts of Asia Minor served by the Anatolian railway. In 1914–18 it was used for transit of troops, while Haydarpaşa was disabled. Now it is used for importing railway supplies, including coal, and for exporting chrome ore, timber, and grain. Its total trade during the 5 years 1936–40 was only an eighth of that of Haydarpaşa. Owing to silting at the head of the gulf, Derince tended to replace Izmit as a port, and from 1936 to 1938 its total trade was more than three times that of Izmit; since the war, however, it has only been half that of Izmit.

Port. The anchorage, in 25 fathoms, though open, is safe. Ships discharge at two main piers, direct to railway wagons. The Railway Pier is 270 yards long with depths of 13–24 feet alongside; it can take two merchant ships on the outer side and another, of about 2,000 tons, on the inner; it is connected by a branch line to the main railway between Haydarpaşa and Izmit; drinking-water is laid on. The other main pier lies to the W.; it has a very short berthing length, but can

take a ship of 5,000 tons at its end; it is served by light railway only; the depth alongside is not recorded. There are two old jetties about 200 yards E. of the Railway Pier. The E. jetty is of wood, with 20 feet alongside; the W. jetty is of iron, with 14 feet alongside, and is used as a boat landing. In a bight N. of the Railway Pier are two small piers about 25 yards long with railway; only deep enough for lighters alongside. There are four 10-ton cranes; three (one fixed and two travelling) on the Railway Pier, and one on one of the iron piers in the bight N. of the Railway Pier. The estimated daily capacity of the port is 800 tons.

There are two large State grain silos, holding 10,000 tons, at the E. end of the Railway Pier, and two large warehouses, with a total area of 29,000 square feet, 100 yards E. of the grain silos. An oil tank, with a capacity of 1,000 tons, is on the railway workshop premises. A naval net depot lies W. of the port.

Climate. The wet season is from November to the end of April. In winter N. and NE. winds alternate with SW., the former often bringing snow and sleet. Fog occurs between October and March with light S. breezes. In summer the heat is tempered from noon to sunset by a fresh NE. breeze; occasionally S. winds bring muggy weather for 4 or 5 days.

Communications. Derince is on the main railway line from Haydarpaşa to Izmit for Eskişehir and Ankara. The railway station is about 850 yards from the Railway Pier. There is a coast road, in bad condition, W. to Haydarpaşa and E. to İzmit.

ECEABAT (Açaabat, Maydos, Maidos, *class.* Madytus). 40° 11′ N., 26° 22′ E. Çanakkale vil.: kaza. Pop. 1,700.

On Dardanelles coast of Gelibolu peninsula. The town (small and partly in ruins) stands on a low cliff where the plain reaches the sea, at the foot of Maydos Tepe, on the N. side of the valley. It contains a large ruined Greek church, and several windmills behind it. A cotton factory stands on the N. of the town. Off-shore anchorage, sheltered from SW. but exposed to N., is not good because of variable currents, but there is a harbour for boats and lighters with a stone pier opposite the centre of the town and a new semicircular breakwater on the N. side. A similar breakwater to be constructed on the S. side was not completed in 1940. A road from Gelibolu passes through the town and continues down coast to Seddülbahir, at SW. end of Dardanelles, and tracks run inland across the peninsula.

ERDEK (Artaki, *class.* Artace). 40° 24′ N., 27° 47′ E. Balikesir vil.: kaza. Pop. 4,700.

A sheltered fishing-village and naval station S. of the Sea of Marmara, on the SW. slopes of Kapidağ peninsula, overlooking the N. shore of the Gulf of Erdek (I, photo. 22, p. 57).

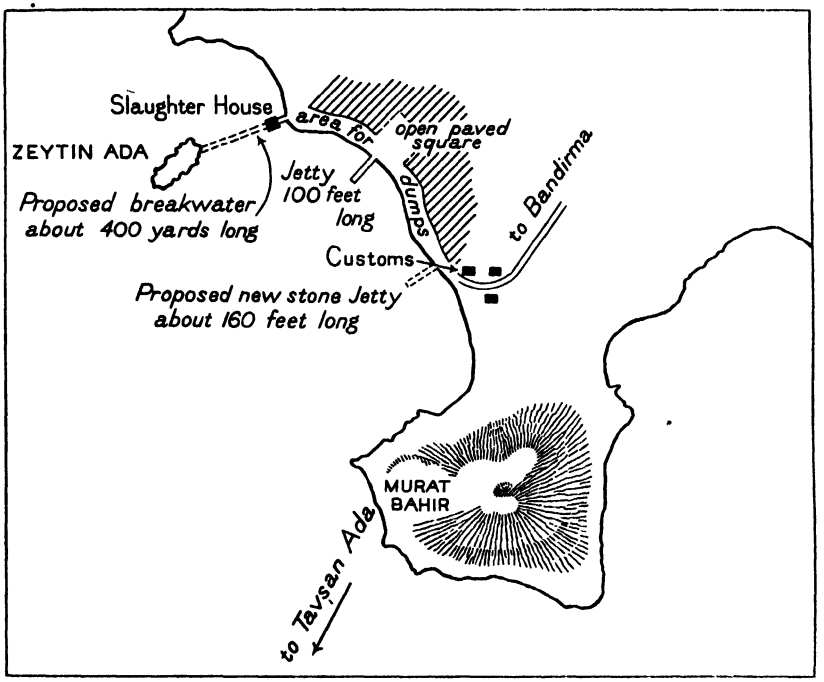


FIG. 12. *Rough sketch-map of Erdek (not to scale).*

The town, though the residence of the governor of Kapidağ, with several mosques and 1,200 houses, is mean and dirty, with narrow streets. Besides port labourers and quarrymen, unskilled labour is available, except at seed-time and harvest. Water is plentiful and good, from falls and streams N. and S. of the town. Provisions are plentiful. Exports are grapes, a special white wine, and fresh fish for Istanbul.

Port. Erdek bay has capacious anchorage, sheltered from all but SW. gales. The bay is formed by a promontory to S. on which is the ruined fort Seydi Gazi Kale. There is anchorage in 10 fathoms between the conical peninsula Murat Bahir (*Gk.* Ag. Simeone) and Tavşan island to SW., and Zeytin Ada island to NW., which it is

proposed to connect with the mainland by a breakwater (400 yds.). A small but sheltered harbour faces SSW. and will be protected by the breakwater. There is a small wooden jetty (100 ft.), 17 feet depth, in front of a paved square on the water-front of the village: it suffered considerable damage in the winter of 1941–2. Two projects are reported for a more substantial jetty. There are no lifting appliances, but open frontage for stores in transit (fig. 12). At Edincik Iskelesi, SE. of Erdek, on the opposite shore of the gulf, there is a small pier with a square building at its landward end.

Climate. N. and NE. winds prevail, often strong in winter, dying away at night in summer; W. and S. winds bring rain in winter and damp close weather in summer. In calm weather there are occasional fogs.

Communications. Road to Bandirma, now the commercial centre (replacing *anc.* Cyzicus on the isthmus); branch road through Edincik to Gönan: tracks to smaller settlements on the Kapidağ peninsula.

GELIBOLU (Gallipoli; *class.* Callipolis). 40° 24′ N., 26° 40′ E.; alt. *c.* 65 ft. Çanakkale vil.: kaza. Pop. 6,650. Agricultural bank. Bourse. Hotel. Electricity station (small).

The town lies on the E. coast of the Gelibolu peninsula, at the N. entrance of the Dardanelles, on a blunt point between Gelibolu bay and Bağçeşme bay, and 1¾ miles from Çardak Burnu on the Asiatic shore. The Utze stream, rising in the low hills to NW., flows through the W. quarter of the town. Malaria is frequent.

Gelibolu was of no importance in antiquity till Justinian fortified it *c.* A.D. 500. Later it was occupied by Genoese and by Venetians, and was the first European conquest of the Turks (1357), though temporarily recovered by Venice (1416). The Ottoman fortress was built by Bayazid. There are tumuli of Thracian kings. The modern town is mostly of wood, and a wooden bridge spans the Utze R. There are many mosques, large cemeteries, and a quarantine station.

Trade. Local products include fruit, especially grapes and watermelons, grain, mulberry trees (for silk), dairy produce, livestock, and fish. Wheat, maize, wine, aniseed, and linseed are exported. Imports are mainly woollens and cottons, tobacco, hardware, iron, petroleum, and other fuel. There are large bazaars, steam flour-mills, fish-preserving plant, and small factories for cotton, silk, leather, and earthenware. Trade has decreased since the railway connected Dedeağaç (Alexandroupolis) with Edirne and Salonika. There is a small coal-store.

Port. The anchorage in bays N. and S. of the town, protected from all but SE. winds (which are not dangerous), is much used at night. The best berth is in 11 fathoms near the Middle Bank, 6 cables SW. of the town. Small craft anchor inshore, though the flats stretch 300 yards from the Utze bridge. Of two small boat-harbours S. of the town, the outer is of 1½ acres and 7 feet deep, with 30-feet entrance, much used by coasting-craft: the inner is smaller and little used. Swell from the Sea of Marmara sometimes sets round Gelibolu point, which is rocky and foul for 1¼ cables SW.

Bağçeşme bay NE. of Gelibolu point has anchorage in 13 fathoms at 2½ cables off shore, but is more exposed than Gelibolu to NE. winds and swell. Landing is possible on a sandy beach 800 yards long, but a shallow flat to W. for 200 yards off shore causes surf in NE. winds. There is landing-beach also NW. of this bay under lee of a rocky point.

Communications. An important motor-road connects the town through Keşan with Uzunköprü; a track branches from it and follows the coast of the peninsula to Şarköy, whence a road connects with Tekirdağ; SW. from Gelibolu the motor-road continues to Eceabat, with branch tracks to the Aegean coast of the peninsula.

GEMLIK (*class.* Cius, Kios). 40° 26′ N., 29° 09′ E. Bursa vil.: kaza. Pop. 5,900. Hotels (3). Met. station. Electricity station (medium).

The prosperous modern town, at the head of the Incir Liman (Gemlik gulf), is the outlet for produce from the Iznik Göl basin, by the Gemlik valley, especially for chrome ore. There are hot springs with baths, between the town and the naval yard. There are artificial silk and soap factories, and oil presses. The valley is well cultivated and the hills around are planted with olives (fig. 13).

Port. There are about 4 square miles of good anchorage, open to W. and exposed to W. winds, but with little sea. The most sheltered berth is in the SE. corner of the bay, in 14 fathoms. The naval yard on the S. shore is deserted, but the wooden mole can be used by small craft. Two piers S. of the town were reported ruined in 1921. Ships discharge by lighters.

Communications. Motor-roads E. to shores of Lake Iznik; S. to Bursa; N. to Yalova. Steamer service to Istanbul.

GÖLCÜK (Geulzuk). 40° 43′ N., 29° 43′ E. Kocaeli vil.: kaza.

This port, S. of the head of the Gulf of Izmit, has now replaced Izmit as the chief naval base in Turkey. But it has comparatively

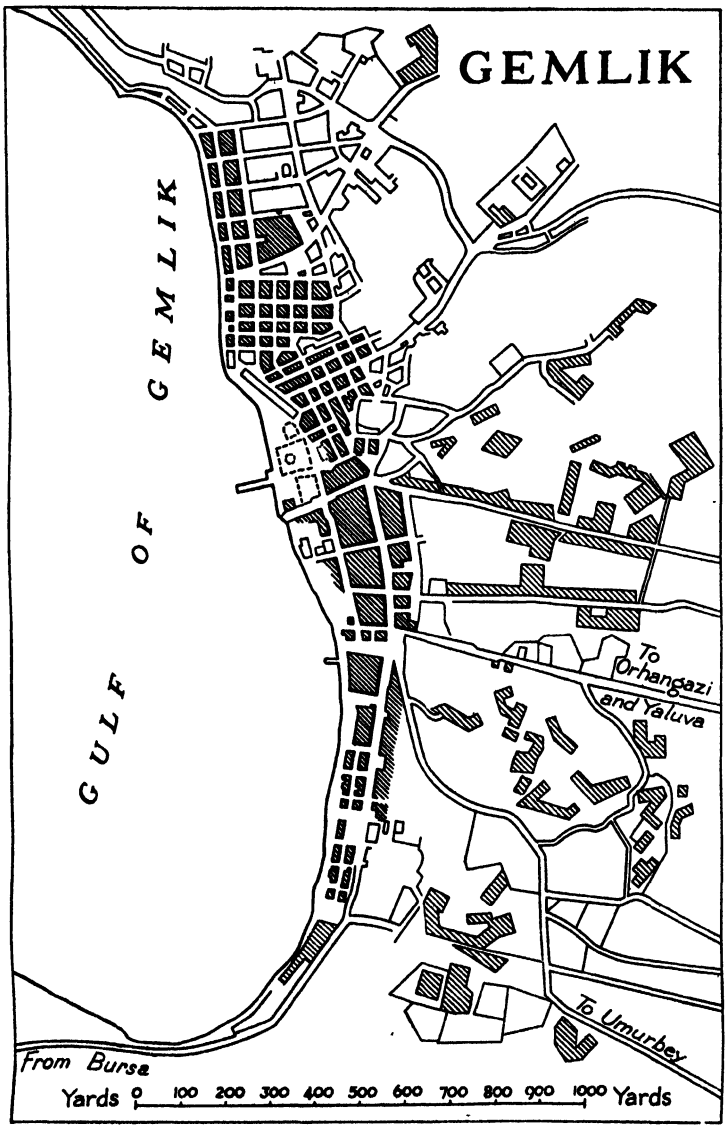


FIG. 13 *Plan of Gemlik*

shallow water (especially 150 yards off Gölcük Burun, a low sandy spit), little protection from prevalent NE. winds, and malarious marshy ground adjacent. The anti-malarial measures planned for 1939 have been postponed. The contract with a German firm for the naval base was cancelled in April 1940. Present establishment includes (1) repair shops and storage buildings; (2) mine-factory and store; (3) floating dock (25,000 tons); (4) deep-water berth ¾ mile E. of floating dock; (5) slip for small naval craft; (6) accumulator factory; (7) underground storage for 11,800 tons of oil.

Communications. (1) Road with telegraph, partly constructed, round head of Gulf of Izmit, (2) W. along coast to Yalova (q.v.). Naval ferry service to Izmit.

HAYDARPAŞA (Haidar Pasha). 41° 00′ N., 29° 03′ E.; alt. 13 ft. (rly. stn.). Suburb of Istanbul. Barracks. Hospital.

The main transit-port, wholly modern, for exports and imports between Europe and Anatolia, lies on the E. shore of the Bosporus between Üsküdar and Kadiköy, 1 mile N. of Moda Burnu, and 1½ miles ESE. of Seraglio point, S. of the Golden Horn (fig. 6).

The town, SE. of the port, adjoins Kadiköy, and is separated from Üsküdar northward by the Selimiye barracks, military hospital (respectively ¾ mile and 600 yds. N. of the railway station), and school of medicine, and by the railway oil-tanks (9,000 tons). Water, supplied from Kadiköy, is plentiful and good. Electric power is supplied from Istanbul. There is an abattoir at Selimiye point.

Trade. Town and port depend wholly on the railway and ferry traffic. Grain and petroleum are exported; manufactured goods are the chief imports, greatly exceeding exports in value.

Port. The natural bay, opening WSW., has been transformed by the modern 'Galata' quay, 320 yards long, with room for three ships, and S. of this is the railway jetty (165 yds.), on which is the railway terminus for Izmit and Ankara. This jetty, whence the ferry crosses to the Golden Horn bridge, is protected by a breakwater parallel with the coast, in 24 feet of water. The S. entrance (130 yds.) is only used by small craft; the N. is 400 yards wide. Ships awaiting berths anchor between the port and the Leander Tower, 3 miles to N., where the rocky coast N. of Moda Burnu hinders landing.

The port is well equipped for handling freight. There are mooring buoys, floating shears, and a crane; there is cold storage (100 tons), with a depot for cold-storage wagons, elevator and pneumatic plant for handling grain, and two large silos (total 14,500 tons), and a

special two-track pier for loading grain. For details of the Bosporus train-ferry *see* p. 270.

Climate. In winter N. and NE. winds bring snow and sleet; fog occurs with light S. breezes; in summer a daily NE. breeze tempers the heat. September is the hottest month.

Communications. The railway yard, repair shops, and engine-sheds are immediately in rear of the terminus, which was planned as headquarters of the railway system, but now houses only the traffic staff.

Besides the railway, there are high roads to Izmit (Kocaeli) and to Üsküdar and the N., but facilities for transport and repair are poor. The new British telegraph cable from Europe comes ashore at Kavak Burnu, 800 yards N.

ISTANBUL PORT. 41° 01′ N., 28° 59′ E.

For site, topography, and history of the city and its suburbs *see* pp. 20–8, plan opposite p. 21.

General Description

The Golden Horn (Istanbul–Galata) is a deeply submerged valley which enters the Bosporus from the W. immediately N. of its S. exit to the Marmara. Both shores (Istanbul to the south, Galata to the north), which are steeply built up, are lined with quays and warehouses. Large vessels go alongside, or anchor inshore using lighters; there is ample anchorage off shore, and off Üsküdar and Haydarpaşa on the Anatolian coast, which are worked in close co-operation with Istanbul.

There is no tide, but a difference of water-level (± 10 in. from normal) according to wind. During S. winds a nasty swell inconveniences traffic across the Bosporus, as far N. as Üsküdar, and may impede operations at Tophane.

Above the quays, the Golden Horn is crossed by two pontoon bridges, between which is accommodation for small craft. There are landing-piers on both banks at the lower bridge. The projected Atatürk bridge between the pontoon bridges (p. 27) will transform all this section of the port. Above the upper bridge there are landings for small craft on the Istanbul shore; the frontage of Pera opposite is occupied by the old naval base and shipyard, with slipway and dry-dock, now being superseded by Gölcük (p. 63).

Trade. Foreign cargoes pass through the Galata custom-house, goods from other Turkish ports through Istanbul. Cargo for Anatolia is discharged direct to the railway quay at Haydarpaşa.

Trade has been reduced by the severance of the European provinces of the Ottoman Empire, served now by Salonika, Kavalla, and Dedeağaç (Alexandroupolis) on the Aegean, or Burgas and Constanza on the Black Sea. Anatolian railway extension also favours Samsun, Zonguldak, Mersin, and Iskenderon, with Antalya in prospect, at the expense of the metropolis. The destruction of much of Izmir in 1922, on the other hand, diverted to the Bosporus former trade with Western Anatolia.

Istanbul exports dried fruits, grain, wool, cotton, mohair, woods, silk, opium, tobacco, goatskins, rags, bones, drugs, attar of roses, and carpets. The chief imports are manufactured goods, tropical produce, coal, iron, lead, copper, tin, earthenware, glass, and timber.

Quayage. Galata quay, reconstructed in 1889, is about 800 yards long with 24–38 feet depth alongside; Istanbul quay (1900) about 400 yards with 20 feet at Sirkeci and 15 feet at Tophane. The terminus and goods yard of the Şark (Oriental) railway for Edirne (Adrianople), Belgrade, and central Europe adjoins the Istanbul quay. A train-ferry plies between Sirkeci and Haydarpaşa by daylight and in fair weather (p. 270), and there are cranes and ample port facilities at both places.

IZMIT (Ismid, Kocaeli, Cocaeli; *class.* Astacus, later Nicomedia). 40° 53′ N., 29° 30′ E.; alt. 7 ft. (rly. stn.). Kocaeli vil. cap. Pop. 18,700. Agricultural bank. Hotels (6). Garages. Malaria commission centre. Meteorological station. Electricity station (medium).

The town lies at the head of its gulf, on convergent southward slopes broken by deep ravines, and surrounded by traces of ancient walls with a medieval citadel. Founded as a Greek colony, it became the capital of the Bithynian kingdom, a firm ally of Rome against Mithridates of Pontus. Under Rome and Byzantium it became one of the chief Marmara ports for the produce of Asia Minor; Diocletian made this his capital and issued here his edict tolerating Christianity, but it was soon superseded by Constantinople, and destroyed by earthquake in 358. The Ottoman Turks captured it in 1326. Conspicuous buildings are the Mosque of Orhan, E. of the town, and the Sultan's palace on a hill above the dockyard. There is a large bazaar, barracks, and former naval station. The modern town extends seaward to the railway station and dockyard. The houses are of wood, on stone foundations, surrounded by gardens. Cypresses crown the hills behind the town, and there is game in neighbouring forests of oak, beech, and fir.

Trade. The region is well cultivated. Silk spinning was formerly

a chief industry. There is still some trade, increased by the railway. Exports include maize, oats, silk, linseed, tobacco, and dairy products, but much local produce now goes by rail to Haydarpaşa; imports are sugar, coffee, iron, rice, petroleum, and manufactured goods; there are factories for paper, cellulose, tobacco, chemicals, and pottery. The electricity station, generating 220–380 volts A.C., is at the paper-mills, ½ mile W. of the dockyard.

Port. Anchorage is good and extensive, in 6–20 fathoms, sheltered from all winds, but rough for boats in W. winds. As the gulf is silting up, Izmit is being succeeded by Derince as a port, and by Gölcük across the gulf as a naval base. There is still some trade, and some small piers along the water-front, but no lifting equipment. Cargo is discharged by lighter from small vessels 800 yards off shore to the two railway piers or the custom-house quays: W. Railway pier, 180 feet, 5 feet depth alongside; E. Railway pier, 300 feet, 18 feet depth alongside; 2 Custom-house quays, each 150 feet, 18 feet depth alongside; the W. one is a well-constructed stone pier.

Naval Dockyard. The old dockyard, which is small, contains the following: offices of the Director of Naval Ordnance, a small ordnance workshop, a small laboratory for the inspection of cordite, a workshop for overhauling torpedoes, a mining store, and workshop. The main store depot is on the N. side of the yard. There is a boat landing-stage, and at the E. end there is a trestle pier for tank-lighters, which carry water between Izmit and Gölcük. The dockyard has now been superseded by that at Gölcük, to which there is a ferry service.

Climate. Winter is wet, with snow, sleet, and fog. N., NE., and SW. winds are common. Summer is hot and dry, with cool breezes. There is much marsh round the gulf-head and malaria is prevalent. There was a typhus epidemic in 1923. Water is brought by pipe from Sapanca lake 12 miles E., but is intermittent: there are also wells and a good spring 1 mile W. of the town.

Communications. On the Haydarpaşa–Eskişehir railway (route 2), and on the Üsküdar–Ankara motor road.

KARABIĞA (*class.* Priapus). 40° 24′ N., 27° 19′ E. Çanakkale vil.: nahiye. Electricity station (small).

The village stands on the W. shore of Karabiğa bay, at the W. end of the Gulf of Erdek, about ¼ mile inland, with a few houses on the beach to SE. It exports beans and other vegetables.

Port. There is good anchorage in 6–9 fathoms. Ships over 600 tons discharge by lighters *c.* 1 mile from the shore. There is a pier

(210 ft.) with 8 feet at head, and in calm weather boats land on the sandy beach. In winter NE. winds occasionally prevent work.

Communications. Rough motor-road to Biğa, 10 miles SW. up the Kocabaş R. Coast tracks E. to Edincik, W. to Lapseki. Weekly steamer to Istanbul.

KARTAL. 40° 53′ N., 29° 10′ E.; alt. 33 ft. (rly. stn.). Istanbul vil.: kaza. Pop. 4,450.

The town lies NE. of the Sea of Marmara, 12 miles from Üsküdar and 2¼ miles W. of Pendik. There are kaolin mines, cement works,

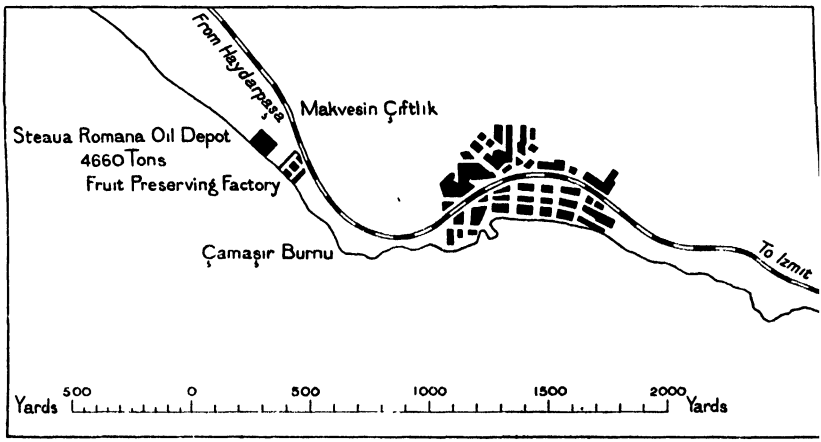


FIG. 14. *Sketch-map of Kartal*

and a cannery for fish and vegetables. Anchorage is poor, but there is a short pier for small boats, and steamers plying to Kizil (Princes') islands. Landing on the beach is possible in summer. Oil-storage tanks (4,660 tons) are ½ mile W. of the town (fig. 14).

Communications. Railway (route 2) and road to Haydarpaşa and Izmit (Kocaeli). Motor-road through Samandira to Üsküdar and Şile.

KOCAELI. *See* IZMIT.

LAPSEKI (Lampsaki; *class.* Lampsacus is 3 m. to N.). 40° 21′ N., 26° 41′ E. Çanakkale vil.: kaza. Pop. 2,300. Electricity station (small).

The town is near the Çinarli stream on a small bay sheltered from NE. by Çardakova point. Lapseki river enters the bay through

unhealthy swamps S. of the town, which is surrounded by trees and has a mosque. It is a prosperous wine centre, and has some trade.

Port. There is anchorage in 19 fathoms, 1,200 yards SSE. of Çardakova point, protected from the Marmara swell.

Communications. A road (1) to Bayramiç by Çanakkale; cart-tracks (2) to Karabiğa; (3) through hills to Biğa; (4) along Dardanelles shore to Çanakkale.

MUDANYA (Mudania, *class.* Myrlea, later Apamea; *med.* Montagnae). 40° 21′ N., 28° 50′ E. Bursa vil.: kaza. Pop. 5,050. Electricity station (small).

The town lies S. of Incir Liman (Gemlik gulf) looking NE. and rising to steep rocks of volcanic rock (fig. 15); a pleasant busy place, formerly the port of Bursa (17 m. SSE.), without important buildings, but several oil factories and some silk spinning; silk from Bursa and chrome are exported. Water from streams is plentiful and good. There is no surplus produce, except fresh fruit. On low ground to E. are many mulberries, vines, figs, and oaks, with olives and vines on hills to S. At seed-time and harvest even unskilled labour is hard to obtain. Since motor transport began from Bursa to Yalova, Mudanya has declined. It was the Greek military base in the War of Independence 1919–22, and place of the Conference and Conventions thereafter. On Imrali island is a penal settlement.

Port. The shore is steep-to, with no anchorage less than 30 fathoms, exposed especially to heavy squalls from NW. There is no harbour, and only one jetty (358 ft.) with two berths, in 14–25 feet, connected by a 2 ft. 6 in. railway with the railway station. Loading is by lighters, but is impossible in rough weather (I, photo. 20, p. 56). Water is not laid on to the jetty.

Climate. Winds (*meltem*) from N. and NE. prevail for nine months, often violently with snow, irregular W. winds for just under three months; and SW. winds at any time: in winter they are frequent, strong and rainy, but in autumn they bring clear weather. Thunderstorms are most frequent in May, June, and July. In summer daily *imbat* breezes (I, p. 207) are more constant and moderate.

Communications. Narrow-gauge (1·05 metres) railway and motor-bus route to Bursa; the nearest standard-gauge railway station is at Bandirma (45 miles W.). There is a motor-road along the coast to Tirilye, thence a dry-weather motor-road SW. to the Karacabey–Bursa road.

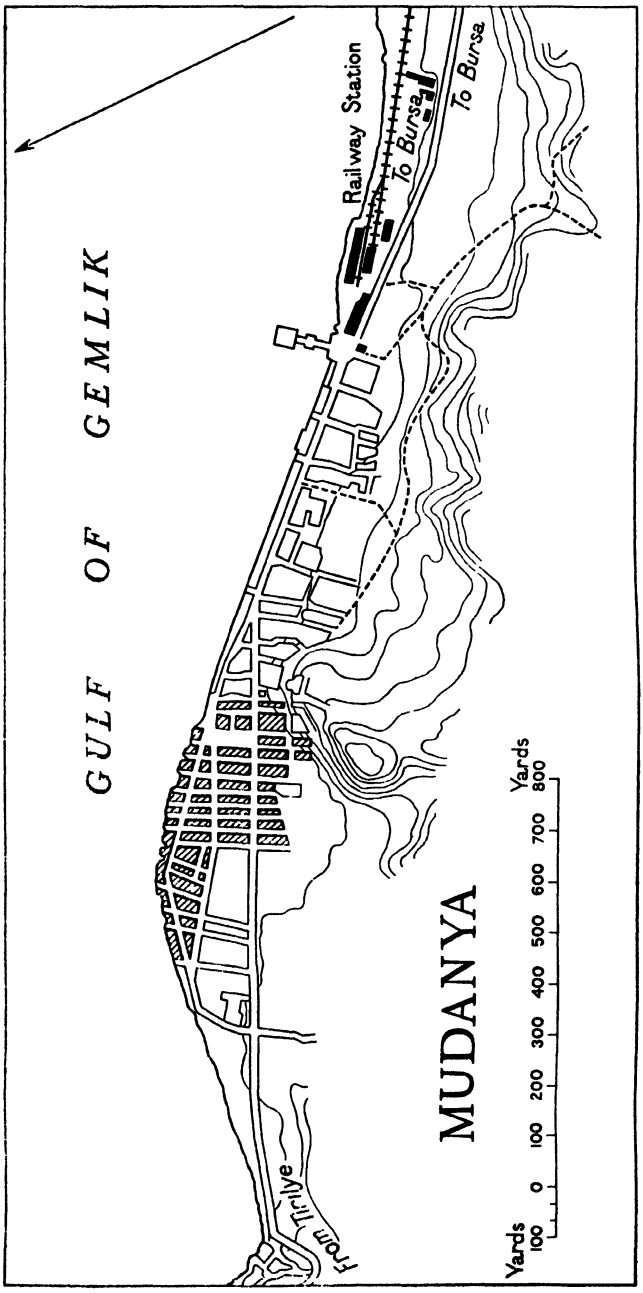


FIG. 15. *Plan of Mudanya*

PENDIK (*class.* Pantichium). 40° 52′ N., 29° 14′ E., alt. 20 ft. (rly. stn.). Istanbul vil.

The small town lies NW. of a bay with anchorage in 4–6 fathoms, sheltered from NE. winds. There is a landing-stage for steamers, and landing on the beach is possible in summer. Shipbuilding and repair yards were begun in 1942, and Pendik was one of the sites suggested as a new naval base.

Communications. Railway (route 2) and road to Haydarpaşa and Izmit (Kocaeli); the Izmit highway leaves the coast here and follows the watershed of the peninsula. Steamer service to Prinkipo (Büyük Ada), the largest of the Princes' Islands.

ŞARKÖY (Sariköy; *class.* Tiristasis). 40° 37′ N., 27° 07′ E.; alt. *c.* 50 ft. Tekirdağ vil.: kaza. Pop. 3,350.

The town lies W. of the Sea of Marmara, SW. of Tekirdağ (Rodosto), on a coastal plain accumulated by converging streams at the foot of the Tekir Dağ. The town has 2 mosques, 3 churches, and flour-mills on the E. and W. outskirts. The neighbourhood has sparse trees and is well cultivated, producing grain, cotton, silk, and tobacco. Copper was mined formerly.

Port. There is open roadstead, and one wooden pier in front of the village (no other information available).

Communications. Dry-weather road NE. along the coast to Tekirdağ; cart-roads SW. along coast to meet Keşan–Gelibolu road near Gelibolu, W. to the Keşan–Gelibolu road at Kavak, N. to the Keşan–Tekirdağ road at Malkara.

SILIVRI (*class.* Selymbria). 41° 04′ N., 28° 15′ E.; alt. *c.* 100 ft. Istanbul vil.: kaza. Pop. 3,650.

The town occupies the site of the ancient Greek city Selymbria, a colony of Megara (before 667 B.C.) on a small bay in the Silivri bight, with two marshy streams to W., 36 miles from Istanbul. Behind it rises a long spur from the high ground inland, ending in conspicuous cliffs (*c.* 150 ft.) crowned by ancient walls. A Roman bridge crosses the valley W. of the town. Corn, wine, tobacco, and white 'Edirne' cheese are exported.

Port. The bay is sheltered only from the north; it is shallow, and in strong E. and S. winds surf makes landing dangerous. A dilapi-

dated pier only accommodates very small craft, and there is now very little trade.

Communications. The highway from Istanbul to Edirne passes through Silivri, following the coast, and 7 miles to W., turns inland to join the railway at Çorlu. A branch NE. links Silivri with Çatalca. Dry-weather motor-road through Saray to Kirklareli. Nearest railway station is Kurfalli, *c.* 13 miles N.

TEKIRDAĞ (Rodosto; *class.* Rhaedestus, Bisanthe). 40° 58′ N., 27° 31′ E.; alt. *c.* 200 ft. Vil. cap. Pop. 20,350. Agricultural and Ottoman banks. Bourse. Hotels (3). Hospital. Meteorological station. Electricity station (medium).

The town lies in the NW. corner of a wide bay of the Sea of Marmara, on the S. slopes of the most easterly spurs of the Tekir Dağ (Tekfur Dagh: 500 ft.) overlooking beach and anchorage. The streets are narrow and ill-kept, rising to 350 feet. Nearly all houses are of wood, except the Government buildings, stores, and baths. The fine mosque of Rustem Paşa was built by the architect Sinan. The electricity station (400 h.p., 292 kW., 220 volts) produces 373,000 kWh. a year. There are warehouses, a flour-mill (15 tons a day), and distilleries. Around the town are gardens, orchards, and woodland. The climate is healthy, but the town is insanitary, and malaria prevalent. Water is obtained from three springs 150 yards from the shore and from wells in private gardens, but is brackish; also in summer from springs between Çorlu and Muratli. The military depot is important, with barracks E. and W. of the town.

Trade. Tekirdağ is an important commercial centre, the second port of European Turkey. Local products include cereals, canary seed, wine, grapes and other fruit, vegetables (especially onions), flax, and leather. Produce is also brought in carts from Keşan. There are a few fishing-boats. Firewood and charcoal come from the Tekir Dağ. There is a disused lignite mine in the district, and better coal at Maymun Dere farther NW., but coal is also imported. Timber comes from Black Sea ports; iron is imported for local smithies; and there is a large manufacture of boots.

Port. The bay is exposed to SE. winds, and landing is difficult. Anchorage is in 6 fathoms; inshore the water is shoal; the beach is obstructed by reefs. There is a quay (500 yds.) with 30-foot roadway and five piers to W.; one is of iron (600 ft. with 15 ft. of water at the head). In 1941 an L-shaped reinforced-concrete pier was being built

out from an artificial embankment: total length *c.* 425 yards; accommodation alongside for 1 medium-sized and 3 large ships. Ships discharge into lighters.

Communications. Steamer services to Istanbul, Bandirma, and Karabiğa. The nearest railway station is at Muratli, 15 miles N. on the Istanbul–Edirne line. Motor-roads run N. to Büyük Karıştiran on the Istanbul–Edirne highway, and SW. along the coast to Şarköy. Dry-weather roads go W. through Malkara to Keşan on the Uzunköprü–Gelibolu road; NW. to Hayrabolu for Edirne and Kirklareli; NE. to Çorlu on the Istanbul–Edirne highway.

ÜSKÜDAR (Scutari; *class.* Chrysopolis). 41° 01′ N., 29° 02′ E.; alt. *c.* 150 ft. Istanbul vil.: kaza. Pop. 124,550 (1927). Selimiye barracks. Cavalry school. Hospitals (3). Medical school. Meteorological station at Anadoluhisari.

Site. Üsküdar is the Anatolian port and landing-place of Istanbul.

History. As its Persian name 'courier' implies, it was long the starting-point for travellers and caravans for the East, and is still a typically oriental town, with many mosques, cypresses, and gardens, but as a port it is superseded by Haydarpaşa and is now mainly residential. The Mahalli and Selamsiz quarters were formerly Greek and Armenian. The vast Moslem cemetery (Büyük Mezaristan) lies on the slopes of Bulgurlu, SE. of the town. Other suburbs are: to N., Anadoluhisari, Kandilli, Beylerbey; to NE., Bağlarbaş; to E., Kisikli; to SE., Haydarpaşa (q.v.), Kiziltoprak, Erenköy; to S., Kadiköy (*class.* Chalcedon). Üsküdar has always been a dependency of the city on the Golden Horn. Constantine gained here his final victory over Licinius. In the Crimean War the British base and hospital were here, and the British cemetery is maintained. There is an important factory for boots and shoes at Beykoz 9 miles N. (photo 63); for glass at Paşabağçe 7 miles N. (photo. 65); for rope at Anadoluhisari; oil storage at points along the coast to N.

Port. The main anchorage, though inconveniently far from Istanbul, is ½ mile wide in 5–10 fathoms between Leander Tower islet (Kizkulesi, I, photo. 16, p. 52), Fener bank, and Ortaköy 2 miles NE. on the European shore; about eight capital ships with attendant small craft can anchor without obstructing merchant traffic. Northward the anchorage is narrow and poor, but nearer Galata, from Leander Tower to Kandilli, there is deep water off the bold coast, and landing-places are small with narrow approaches. Better anchorages and

landings are farther N. in Incir, Beykoz, and Umur bays; but the commercial facilities are at Haydarpaşa.

Communications. The railway terminus is at Haydarpaşa, with steam ferry to Istanbul. Motor-roads run N. along the Bosporus shore through Beylerbey, Kandilli, and Beykoz; to Ömerli for Beykoz, Iriva, and Şile; to Samandira for Kartal, Pendik, and Izmit; and S. to Haydarpaşa for Erenköy, Maltepe, and Kartal.

YALOVA (*class.* Pythiae Thermae): 40° 40′ N., 29° 18′ E. Kocaeli vil. Pop. 2,650. Hotels. Hospitals and spa. Electricity station (small).

This is the chief outlet for agricultural and industrial goods for the Bursa region. The Roman hot baths are still frequented.

At the mouth of Arpali river 1 mile W. is a breakwater protecting a very small harbour, which *kayiks* can enter in nearly all weathers; 4 feet of water on the bar. Stone pier (140 yds. with 9 ft. alongside) at the village.

Communications. Motor-roads (1) through Orhangazi and Gemlik to Bursa, with bus and lorry services; (2) to Karamürsel, Gölcük, and Izmit with telegraph: a bad stretch between Yalova and Karamürsel; (3) SW. to Yalovakaplicalari (baths) whence tracks reach Gemlik gulf. Regular steamer service to Büyük Ada (Prinkipo) and Istanbul.

AEGEAN PORTS

AHIRLI. *See* KARABURUN.

AYVALIK (Aivali; *Gk.* Kydoniai; *class.* Cisthene?). 39° 19′ N., 26° 43′ E. Balikesir vil.: kaza. Pop. 13,100 (21,000 in 1910). Iş, Agricultural, and Ottoman banks. Electricity station (medium).

Site. The town lies on the E. side of Ayvalik bay, sheltered by the Mosko islands. The peninsula to the W. is scrub-covered, with a few pines and fringe of marsh. To the SE. there is a fertile and cultivated plain. The hilly country to the E. and NE. has many olive-trees. The climate is healthy, and the town was formerly a resort of well-to-do people from Mytilene. There is water from two good springs and from wells. Provisions are plentiful.

Trade. The town was refounded in 1781 as a privileged Greek settlement, but was destroyed by fire in 1821, rebuilt about 1850, and evacuated in 1922.

There are several olive-oil mills, producing the best olive-oil in Anatolia, soap factories, tanning yards, distilleries, a flour-mill, salt mines, and granite quarries. Local grain and timber are good. Numerous fishing-boats are employed. *Kaşer* cheese is made locally. The chief exports are provisions (especially fish for Istanbul and Izmir), fruit, valonia, tobacco, and hides; imports are raw hides, wheat, and sugar.

Port. Ayvalik bay has spacious landlocked anchorage in 5–6 fathoms. Ships discharge by lighters, 50 to 100 yards from the shore. The estimated daily capacity of the port is 100 tons.

Communications. A rough motor-road runs NE. to Edremit via Burhaniye and another goes SE. to Dikili for Bergama and Izmir. In normal times there is frequent steamer communication with Izmir, Mytilene, and Istanbul, also with Lemnos, Dedeağaç (Alexandroupolis), and Salonika.

BODRUM (Bodurum, Budrum; *class.* Halicarnassus; *med.* Petronium). 37° 01′ N., 27° 25′ E. Muğla vil.: kaza. Pop. 4,550 (*c.* 6,000 in 1895). Electricity station (small).

Site. The town lies on the E. shore of its circular harbour, at the head of Bodrum bay, which opens S. from the Bodrum peninsula into the Gulf of Kerme (*class.* Ceramus) and is protected by Kara island (*class.* Arconnesos). The town and harbour are sheltered to E. and N. by steep hills (2,000 ft.). The climate is mild at all seasons, owing to this sheltered position. Water, except for irrigation, is scarce and not good, and in the summer is obtained only from cisterns. The region is subject to earthquakes: there were shocks in 1933.

History and Description. The prosperity of ancient Halicarnassus depended on its traffic with the fertile lowlands about Milas (*class.* Mylasa) and its safe port on the coasting route. The peninsula contains the shaft and slag-heaps of the silver mine at *class.* Myndus. The town was the birthplace of Herodotus. Ancient walls encircle the harbour. The massive castle of S. Peter, built by the Knights of Rhodes (A.D. 1450), stands E. of the harbour on a low promontory connected with the modern town by a sandy isthmus. The former Greek quarter (evacuated in 1922) lines an open beach to the E., while the older Turkish town, with the *konak*, mosque, and bazaar, is around the port to the N. of the castle. The site of the ancient Mausoleum (one of the 'Seven Wonders of the World') is in a W. suburb. The harbour was used by the Germans as a submarine base in 1915 (I, photo. 34, p. 83).

Trade. Fertile gardens surround the town as far as the hills. The peninsula to W. has an alluvial cultivated coastal plain, surrounding a rough upland of volcanic beds, with small fertile valleys, cultivated till 1922 by Greeks from Cos and Calymnos. Figs, grapes, oranges, almonds, olives, and corn were exported, and there was some sponge-fishing also in Greek hands.

Port. There is sheltered anchorage in Bodrum bay in 9–24 fathoms, good holding ground, suitable for a large fleet. It has little swell and is easy of approach. It would be suitable for seaplanes. The old harbour is entered through a passage 50 yards wide between the ruins of two ancient moles. It is shallow and is only suitable for small craft; the bottom is covered with weed. There is a small pier W. of the castle, with 6 feet alongside. Ships discharge by lighters in the bay. The estimated daily capacity of the port does not exceed 200 tons. Landing is possible at the town itself, in the port, and in other coves farther west (I, panorama, fig. 20, p. 89).

Communications. A road, said to be passable in all weathers, leads NE. to Milas over a low pass, with branches W. to Küllük, E. to Ahiköy for Muğla or Aydin. Paths lead W. to the coastal villages of the peninsula, and E. to Ören for Muğla and the landing-place at the head of the Gulf of Kerme.

BOZCAADA (Tenedos). 39° 50′ N., 26° 03′ E. Çanakkale vil.: kaza. Pop. 1,700.

The town lies on the NE. coast of Bozcaada (Tenedos) island, at the E. foot of Mt. Sana (385 ft.). It is small, and of little commercial importance. The houses are mostly of wood and are surrounded by gardens. There are three mills at the SE. end of the town. Water and a small supply of provisions are obtainable. The chief exports are wine and raisins. The island also produces corn, cotton, and oil. Wheat, flour, olive-oil, wood, and manufactured goods are imported.

Port. The port is formed by a curve in the shore, and is protected from N. winds (*tramontana*) by a mole 200 yards long, projecting E. from the peninsula of Kum Castle. It can only accommodate small vessels (depth gradually decreases from 6 fathoms in the entrance to 1 fathom near the head), but larger vessels can anchor in 9 fathoms *c.* 400 yards E. of the mole head, where, however, they are exposed to N. and NE. winds, which are frequent and dangerous in winter.

Communications. There are only tracks inland.

BURHANIYE (Kemer). 39° 30′ N., 26° 59′ E. Balikesir vil.: kaza. Pop. 5,600. Agricultural bank. Electricity station (small).

The town lies at the head of the Gulf of Edremit, 2¼ miles inland, near the S. edge of the marshy plain and the right bank of the Kara Su, which flows NW. from the Yaylacik Dağ.

The plain extends 7 miles E. and is well cultivated. Local products are exported, especially olives, olive-oil, and valonia.

Port. Burhaniye bay affords poor anchorage, being rocky, and open except between NE., through E. to S.; there is landing at the head of the bay.

Communications. There are rough motor-roads NE. to Edremit and SW. to Ayvalik; and tracks to Bergama and Dikili.

ÇEŞME (Chesme, Cheshme, Chesnie; *class.* Cissus). 38° 19′ N., 26° 19′ E. Izmir vil.: kaza. Pop. 3,900 (16,300 in 1882). Electricity station (small).

The town lies on a slope on the E. side of its harbour, near the head of Çeşme bay, on a narrow tongue of land separating it from Boyalik bay. It possesses several mosques, a Greek church, custom-house, warm springs, and public baths. It is now the popular bathing-resort of Izmir. The chief export is raisins.

Port. Çeşme bay is protected from the W. by Khios island, but is exposed to swell and sea from strong NW. winds. Large vessels may anchor in the approach to Çeşme harbour, about 3 cables NE. of Kizil Burun lighthouse, in 12 fathoms, or farther NW. in 15–16 fathoms. There is also anchorage about 3 cables E. of Kizil Burun lighthouse, in 10 fathoms, good holding ground. Nearer the town the holding ground is bad, the bottom being rocky. Landing on the beach is possible in fine weather. The port is very little used, however, except for private yachts and small schooners from Khios.

Communications. There is a good motor-road to Izmir through Alaçati and Urla. A track leads 2½ miles N. to Köse, and another 2½ miles SW. to Çiftlikköy. Telegraph cables land close to Kizil Burun, on the W. side of the harbour.

DATÇA (Datcha, Dadya, Reşadiye). 36° 45′ N., 27° 38′ E.; alt. 328 ft. Muğla vil.: kaza. Pop. 1,350.

Datça is the chief village in the Reşadiye peninsula, which separates the Gulf of Kerme on the N. from the Gulf of Hisarönü on the S. It stands 1½ miles inland, overlooking fertile cultivated lowland around

Datça bay. Good water is obtained from streams NW. of the bay. There are ancient ruins on the SE. point between Datça bay and Çatalia bay.

Datça bay has anchorage in 6–25 fathoms, sheltered from all winds from SW. through N. to E. Landing is easy on the long sandy beach, except in SE. winds.

Communications. An earth road leads NE. to Marmaris. There are tracks SE. to the landing-place, SW. to the end of the Reşadiye peninsula at Cape Kriyo (Deve Burnu, *Gk.* Cavo Crio), and NW. to the N. shore of the peninsula.

DIKILI (Dikeli; *class.* Attalia?). 39° 03′ N., 26° 54′ E.; alt. *c.* 300 ft.
Izmir vil.: kaza. Pop. 3,400. Electricity station (small).

The town stands at the head of Kabakum bay, opposite Mytilene island. Most of its houses are said to have been destroyed by earthquake in 1939. Dikili is the port for Bergama. It exports local produce.

The bay is sheltered from S. and E. winds. Landing on the beach is possible in fine weather or with offshore winds.

Communications. There are motor-roads NW. to Ayvalik and E. to Bergama (17 miles), with a branch S. to Menemen for Izmir. Tracks lead into the hills to the NE. and along the coast to the SW.

ENEZ (Enos, Aynos; *class.* Aenus). 40° 43′ N., 26° 03′ E.; alt. *c.* 50 ft.
Edirne vil.: nahiye.

Enez is the port of the Meriç (Maritsa) valley, and lies 2½ miles upstream on the E. bank of the river, immediately S. of the Greek frontier, and W. of the foothills of Çataltepe (1,200 ft.), on a ridge of rock among marshes and lagoons (Dalyan Göl, Dirana Göl). The site is unhealthy, with much malaria.

The site has always been of commercial importance, with a prehistoric mound, a Greek city, a Roman station on the road from Thessalonica to Byzantium, and a Genoese castle built by the Gattelusi of Mytilene. But the modern port is at Dedeağaç (Alexandroupolis), W. of the river, in Greece, with railway to Edirne and Salonika.

There is open anchorage, and a landing-beach 2 miles SW. of the town. Though there is a sandbar (3½ ft.) and many sandbanks in the river, flat-bottomed boats ply as far as Edirne.

Communications. A cart-road crosses the hills E. to Keşan for Edirne, Tekirdağ, and Gelibolu. Tracks lead to Tuzla Göl and Ibrice on the N. shore of the Saros gulf.

FOÇA (Focha, Foja, Fokia, Fouges, Foujes, Eski Foça, Eski Foja, Eski Foka, Karafoça, Karaca Foka; *class.* Phocaea; *Gk.* Palaies Phokes). 38° 40′ N., 26° 46′ E. Izmir vil.: kaza. Pop. 2,750 (6,000 in 1895). Electricity station (small).

Site. The town lies near the N. entrance of the Gulf of Izmir, on the E. side of the sheltered E. Bay of Foça South Harbour. The early Greek settlement became one of the chief cities of Ionia, with colonies at Marseilles, in Corsica, and as far as the Ebro river. It resisted the Persian conquest, however, and was destroyed about 540 B.C. In later antiquity it was unimportant. The ancient and medieval town lies on a peninsula; its walls appear to be Genoese. To the NE. is a better quarter round an inner basin and salt-pans. The town in 1939 suffered severely from earthquake.

Exports are raisins, olive-oil, and salt. Small sailing-vessels are built.

Port. Foça Harbour, comprising North and South Harbours, lies between Orak (Drepano) island on the N. and Deve Burnu on the S. The two harbours are separated by a tongue of land ½ mile long, and an inshore islet with ruined fort, and by the islands of Agios Georgios (Incir) and Oğlak farther W. North Harbour, which is nearly circular, lies E. of a spit extending 800 yards SE. from the S. point of Orak (Drepano) island. South Harbour is entered between the S. end of Agios Georgios (Incir) island and a point 800 yards SE. of it, on which are the ruins of a Venetian fort, lying *c.* 1 mile NE. of Deve Burnu. Thence the harbour extends 1 mile E. The S. shore of South Harbour is divided into two bays by Değirmen Burnu, E. Bay, on the E. side of which the town stands, being a well-sheltered basin 700 yards in diameter. The bay is surrounded by high hills except to the SE., where there is a valley. There is sufficent water, from numerous wells in and around the town.

North Harbour is bordered by shallow water, especially on the E. side where there are depths of 2 fathoms ¼ mile off shore, but there is anchorage in 5–13 fathoms in the S. part. It is exposed to W. winds and is not suitable for landings.

South Harbour affords anchorage within the entrance in 10–20 fathoms, even in the strong SE. gales which blow out of the gulf. East Bay is fringed by a narrow, shallow bank; there is sheltered anchorage in 10 fathoms for vessels with local knowledge. There are light jetties NE. of the town with 15 feet of water at the ends, and a quay SW. of the town with 15 feet alongside. Landing on the beach from boats

and small lighters is possible all round the harbour except off Değirmen Burnu. The climate is healthy, and the town is a summer resort for the people of Izmir.

Communications. There is a rough motor-road up the valley to the SE., to the Bergama–Izmir highway 7 miles NW. of Menemen, on the railway between Izmir and Manisa. There is a more direct track SE. to Izmir, and tracks SW. to Cape Merminci and NE. to Yenifoça ('New Foça', founded by the Genoese in 1421 to work alum mines in the hills). There are direct telephone lines to Yenifoça, Menemen, and C. Merminci.

ILICA (Ilija). 39° 35′ N., 26° 52′ E. Balikesir vil.

The small port lies near the head of the Gulf of Edremit, 2¾ miles NE. of Kara Burun. There are hot springs and baths, and two factories. Lead ore is exported from the mines at Balya, about 40 miles NE., as well as local produce.

Port. Ilica bay affords good anchorage in 9 fathoms, mud, about ½ mile from the shore, or farther out if necessary, sheltered by high ground from W. through N. to NE. A small pier is reported for shipping the lead ore. Two miles E. of Ilica, at Akçay (Axia), is a pier with a depth of 10 feet at its outer end, used as the landing-place for Edremit, about 5 miles inland. There is anchorage ½ mile off shore from Akçay, in 7–17 fathoms, mud; it is sheltered from NW., through E. to S., but is considered inferior to the anchorage off Ilica.

Communications. Ilica is the terminus of a small narrow-gauge (0·75 m.) railway, originally constructed to carry minerals from the zinc mines at Balya, but now believed to operate only from Palamut, 10 miles E. of Edremit. There is a motor-road E. to Edremit, and a coastal track W. along the N. shore of the gulf for 15 miles to Küçük Kuyu, after which it turns inland for Ayvacik, Ezine, and Çanakkale.

IZMIR (*class.*, *Eng.* Smyrna). 38° 24′ N., 27° 06′ E.; alt. 23 ft. (rly. stn.). Vil. cap. Pop. 184,350 (1940), 170,950 (1935). Banks. 28 hotels (Smyrna Palace, Naym); garages; former British seamen's hospital (empty); 3 barracks, 1 army hospital; Turkish institute (Paradisos); meteorological station; archaeological museum; cinemas. Electricity station (large). Foreign consulates.

Site. The entrance of the Gulf of Izmir between Karaburun and Foça is narrow, and within it Uzun Ada (*Gk.* Makronisi: 'Long Island') divides the channel. Izmir itself lies on a deep bay 4 miles

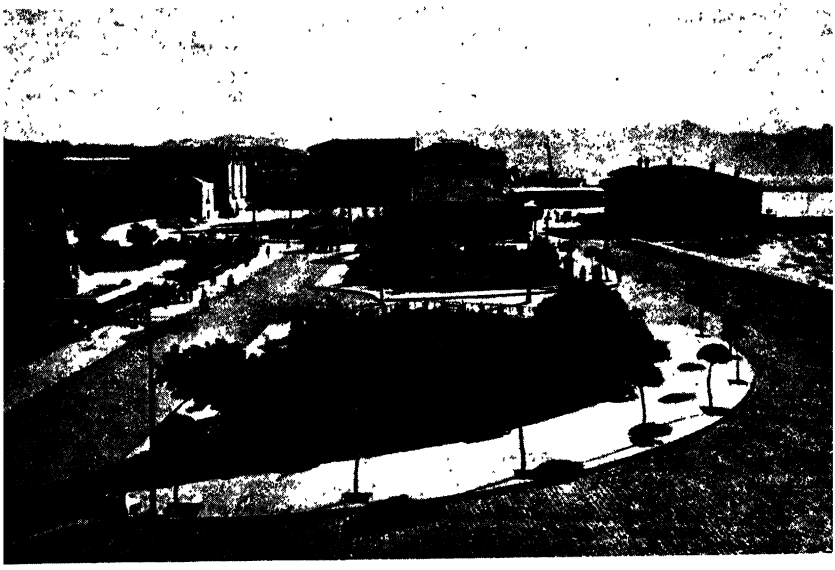
wide, SE. of the main gulf. It is thus a first-rate port, safe in all weathers, and completely sheltered to NW. by an alluvial promontory, the old delta of the Gediz river, and protected from further encroachment by the diversion of the river to a new outlet in Sakiz bay farther north (I, fig. 15, p. 78).

There are frequent earthquakes, and violent shocks occurred in 1688, 1788, 1880, and 1939.

The town lies on the S. side of the gulf in a picturesque, rich, and highly cultivated district. Mt. Pagus (460 ft.), a volcanic 'neck' with ancient and medieval (Genoese) citadel, is an outlier of the Tmolus range. West of it, Değirmen Tepe, a similar detached hill, but lower, reaches the coast, bounding and defending the site on the S. East of Mt. Pagus the Meles Çay, flowing from Tmolus northward, has thrown forward a wide delta about $1\frac{3}{4}$ miles into the gulf, with a straight shore running NE. from Değirmen Tepe to Darağaç point ('the Point'), nearly north of Mt. Pagus, screening the river-mouth about a mile SE.

History. An older native town was twice colonized by Aeolian and by Ionian Greeks, before 650 B.C., became subject to Lydia and to Persia, was liberated by Athens (476), and refounded by Lysimachus (*c.* 320). Under Roman rule it prospered, as its great aqueducts at Buca show—and became one of the 'Seven Churches' of the province of Asia (*Rev.* ii. 8). It was taken by the Seljuks (A.D. 1084), by Tamerlane (1402), by the Genoese and Knights of Rhodes (1348–1412), and by the Ottoman Turks, but remained the principal centre of Greek and other western interests in Anatolia; hence the Ottoman phrase *Giaour Izmir*, 'infidel Smyrna'. Latterly its commerce was restricted by the competition of Istanbul. The enclosed harbour (*port abri*) was constructed 1870–5. Since the fire of 1922 it has been partially rebuilt and reoccupied by Turks and Jews. A firm of British consulting engineers has completed a project for a modern port for Izmir, estimated to cost £1,000,000 sterling.

The Town. The ancient and medieval city lay at the foot of Mt. Pagus and Değirmen Tepe, facing NW., with narrow crooked streets and projecting windows and roofs; here are the Hisar Cami and other mosques, the *hans* and the bazaar (on the site of the old harbour and castle of the Knights), with Moslem cemeteries around. This is still the poorer Turkish quarter. There are barracks near the *Konak*, near the Kemer bridge, and at the Point; naval repair-station and mine depot with stone jetty at Karşiyaka; military airfield at Seydiköy; seaplane-base at Reşadiye. From the *Konak* (government



25. *Izmir. The Sea Front*



26. *Izmir. The Port Abri*



27 *Izmir. The Exhibition Grounds (Culture Park) from the Kadife Kalesi*

buildings), barracks, and prisons, on the shore NE. of Değirmen Tepe, the modern stone quay with tram-lines runs straight to the Point (2,500 yds.) with the enclosed harbour (*port abri*) about 400 yards from the *konak* (figs. 16, 17, photo. 26; I, photo. 31, p. 75).

Formerly the Jewish and Armenian quarter lay E. of the enclosed harbour, the Frank quarter N. of it, with the Greek quarter inland; and N. of these, towards the Point, the better residential quarter. But these divisions were already becoming obsolete when fire destroyed all but the bazaar and old Turkish quarter in September 1922, and the Christian survivors were expelled. The Jews were allowed to remain, and have now most of the shops and local business. Much of the site is still only partly rebuilt, with broad avenues around a vast exhibition ground and park, and roads roughly paved (photo. 27).

East of the 'Point' the Railway Pier gives access to the terminus, repair-shops, and marshalling yard of the Aydin railway (route 17), which runs south past Mt. Pagus, crossing the Meles Çay, and the Turgutlu road and railway (route 14), which runs eastward from the Basmahane terminus E. of the port. The railway repair-shops for the old French railway to Afyonkarahisar are at Halkapinar. The caravan bridge (Kemer) over the Meles carries the Turgutlu road. Near this bridge are large camping-grounds for camel caravans. Modern suburbs extend SW. to Kalifatya, with tram to Göz Tepe; E. and N. round the head of the gulf to Karşiyaka (Cordaleo); and inland to Burnuva (Burnabat) and Buca. Principal settlements are: to SW., Karataş beyond Değirmen Tepe; Göz Tepe, on slope of hills overlooking the gulf; hot springs and baths towards Urla. To N., Karşiyaka (with baths), 7 miles, at foot of Mt. Sipylos. To NE., Burnuva (Burnabat), 5 miles, sheltered by hills, with gardens and springs. To SE., Buca, 5½ miles, pop. 5,000.

Trade and Industry. Izmir is the second port of Turkey, and formerly centre of Greek and other European interests. The surrounding country is fertile and provisions are plentiful; there is cold-storage (for *c.* 700 tons) at Mezbaha, the abattoir at the head of the gulf. At Karşiyaka boats are built, and vessels repaired on a hauling-up slip at Alaybey. Principal exports are figs, raisins, olive and other vegetable oils; sponges from the islands, liquorice from the Büyük Menderes valley, wax from the southern forests; grain, cotton, valonia, tobacco, and oilcake; wool and hides from the interior; carpets and rugs from Uşak and Gördes; salt, antimony, chrome, and iron ore. Manufactures include soap at Bayrakli, beer at Halkapinar, spirits at Burnuva, bricks at Paradisos; oil-tins at Turan; textiles, furniture, hardware;

and the preparation of tobacco, valonia, and liquorice. Grape syrup (*pekmez*) and the local *halva* sweetmeat go to Greece and Russia.

Imports include cotton and woollen goods, silk, linen, leather, coffee and sugar, potatoes, butter, hardware, and iron goods, alcohol, petroleum, and Black Sea coal.

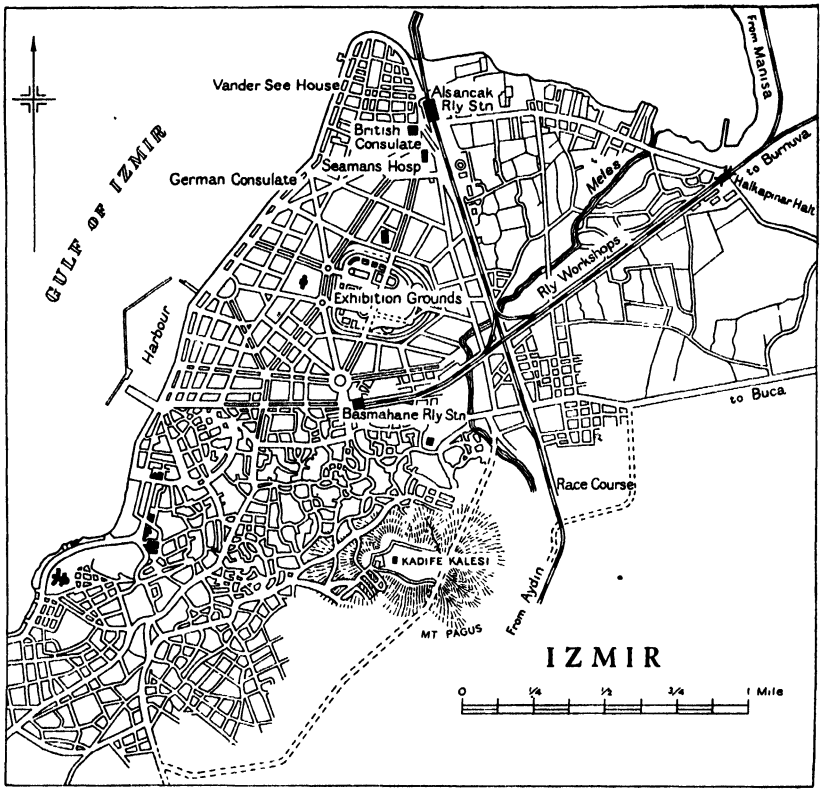


FIG. 16. *Plan of Izmir*

Port. The outer roadstead opens W. into the gulf, and offers about 6 square miles of anchorage, in 7–11 fathoms, safe in all weathers. There is about 2½ feet of tide; currents due to wind are irregular and sometimes strong; during W. winds there is a choppy sea.

There are two main port areas: the Railway Pier, close E. of Daraǧaç point, and the enclosed harbour (*port abri*), 2,000 yards SW. The two ports are connected by a stone quay (60 ft. wide, with 2–4 fathoms alongside).

The steel Railway Pier is the terminus of the Izmir–Aydin State railway (route 17); there are 4 railway tracks along it. It is used mainly for the import of munitions and heavy material and the export of liquorice root. It is available in all weathers except in strong W. winds. It stretches 430 yards NNW., with an arm 200 yards long to NNE., and has 7 berths. Ships discharge direct to trains alongside. There are 7 steam travelling cranes. The pier is lit by electricity.

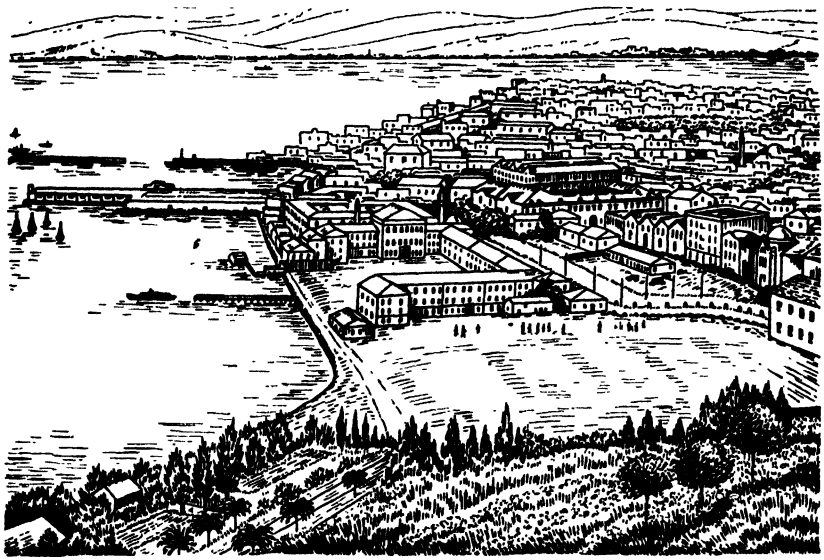


FIG. 17. *Izmir from the south-west, showing harbour*

The enclosed harbour (*port abri*), at the SW. end of the quay, is used entirely for the commercial export and import trade, and is safe in all weathers. It is formed by a detached mole and two piers. The N. entrance is 255 feet wide and 34 feet deep; the S. entrance is 130 feet wide and 22 feet deep. There are depths of 25–30 feet inside the harbour. The quay is 2,250 feet long and has 15–18 feet of water alongside: 20 steamers can berth end-on to the quay, and discharge by lighters and pontoons. Large ships (over 8,000 tons) anchor outside the harbour and discharge in the same manner. The detached mole (3,300 feet) is shaped like a wide V, with the apex NW., seawards. A coal wharf, where ships can lie alongside in 25 feet, extends 240 feet SW. from the S. end of the mole, projecting beyond the SW. entrance of the harbour. The Custom-house pier forms the SW. side of the harbour; it is 690 feet long, with 18 feet of water alongside,

and has 1 hand crane. The NE. side of the harbour is formed by a small pier about 450 feet long, on which the Port and Health offices are situated; it is used by ferry-service vessels.

There is another small pier on the W. side of Darağaç point. On the N. shore of the roadstead there is an oil pier at Turan and a ferry-service pier at Karşiyaka, where there are also several small bathing-jetties and an esplanade.

The estimated daily capacity of the port is 2,500 tons; it could be raised to 3,500 tons by the provision of additional tugs, lighters, and labour.

There are numerous large warehouses at Darağaç point, at the shore end of the Railway Pier, abreast the enclosed harbour, and in the town. The single-story customs sheds on the quay near the Custom-house pier have a superficial area of about 133,000 square feet.

There are 7 tugs, about 50 lighters, and 4 passenger ferry-boats. There is a 25-ton floating crane and a 3-ton travelling crane, as well as the cranes on the piers; in January 1942 it was proposed to transfer some cranes to Iskenderon. Zonguldak coal is stored on the detached mole: it is discharged into lighters at the Railway Pier and conveyed thence to the coal depot. There are oil tanks at Turan on the N. shore of the gulf, but there are normally no stocks of oil fuel. There is a slipway at Alaybey, near the boat-building yards at Karşiyaka, on the N. shore of the gulf, about 3 miles from Izmir, and also 4 new smaller slipways (no details available).

Landing is possible anywhere along the sea-front or at the Railway Pier.

Water. Water is plentiful and excellent; it comes by pipe from springs at Halkapinar, and is supplied to ships by hose from hydrants on the quay. The reservoir is at Burnuva, five miles to NE. The fire station in Gazi Boulevard is well organized. Fountains in the old Turkish quarter are supplied by aqueduct from the Tahtali Dağ and Paradisos (2 miles S.), and good water can be pumped from many artesian wells.

Climate. The climate is mild and healthy and there have been no serious epidemics for many years. Visitors should beware of chills and exposure to cold winds, and should take precaution against malaria.

Winter is wet and generally mild, but there is some frost (m.d. min. 39°) and NE. and E. winds prevail. Summer is fairly hot and damp (m.d. max. 92°), and SW. and W. winds are commonest. The rainfall is 25 inches.

Communications. Though Izmir is enclosed and protected by mountainous country, communications with other coast districts, and with the interior, are easy.

(*a*) The Izmir–Manisa–Afyonkarahisar line (Railway 14), for Eskişehir, Ankara, and Konya; from Manisa the Balikesir–Bandirma line (Railway 15) diverges N. Suburban lines serve Burnuva (Burnabat) and Buca.

(*b*) The Aydin line (Railway 17) southward has branches to Ödemiş, Söke, Çivril, and Denizli, and is continued by Dinar to Afyonkarahisar and to Eğridir, with projected extension to Antalya.

Main roads lead N. to Menemen (20 miles) for Manisa (40 miles), Bergama (66 miles), and the N.; NE. by Burnuva to Manisa (25 miles); E. to Turgutlu (36 miles); S. to Seydiköy for Torbali, Tire (65 miles), and the S.; W. to Urla and Çeşme (52 miles) with branches N. to Karaburun and S. to Sığacik bay.

There is frequent steamer communication with Istanbul, and ferry-service to Karşiyaka and around the gulf.

Motor transport is abundant; with bus-service on the quay and to principal suburbs.

Airfields are at Gaziemir and Seydiköy (military).

KARABURUN (Ahirli, Akhirli, Akhyrly). 38° 37′ N., 26° 31′ E.; alt. *c.* 165 ft. Izmir vil.: kaza. Pop. 750.

The town lies near the NW. entrance to the Gulf of Izmir, a short distance S. of the head of Port Saip (Sahib), a bay formed by Fener Burnu on E. and Büyük Saip island on N. Water is available. Mercury is exported from neighbouring mines.

The anchorage in 10–20 fathoms is sheltered from SE. winds which at times blow strongly out of the Gulf of Izmir, but open to NE. and only suitable for small vessels. At the head of the bay is a pier, and landing is possible except during NW. and NE. winds. A motor-road leads SE. to the head of the Çarpan gulf for Çeşme (W.) and Urla and Izmir (E.).

KÜLLÜK (Chulukioi, Kiulukioi). 37° 15′ N., 27° 38′ E.; alt. 30 ft. Muğla vil.

The small port lies on the NE. cove of the head of the Gulf of Mandalya, S. of the marshes of the Değirmen river. There is good anchorage off the village. Landing is possible N. of it and at Asin jetty at the head of the cove (I, photo. 33, p. 82); the whole shore was

defended in 1914–18 by rifle-pits, trenches, and gun emplacements. An above-water rock, surrounded by a narrow bank, lies close off the SW. point of the cove, *c.* 3½ cables WSW. of Küllük village.

Emery, brought by lorries from neighbouring mines, is exported. A motor-road runs inland to Milas and Ahiköy on the Aydin–Muğla road, with a branch SW. to Bodrum.

KUŞADASI (Kush Adasi, Kushadassi, Scalanuova, Skalanova; *class.* Marathesium, Nea Ephesus). 37° 52′ N., 27° 17′ E.; alt. *c.* 170 ft. Izmir vil.: kaza. Pop. 5,850. Hotels. Meteorological station. Electricity station (small).

The town is on a bay sheltered from the W. by a promontory and by a small island, Kuşadasi, surrounded by a wall with a square tower and a lighthouse. There is a projecting white cliff (Ak Burun), about 1¼ miles NE. The town is built on a steep, rounded hill overlooking the sea on the NW. and N. A mountain stream flows through the town. The climate is pleasant and healthy. Water, good and plentiful, is supplied by the Değirmen river, 2½ miles S. (I, photo. 32, p. 82).

Kuşadasi is a medieval Frankish foundation, replacing ancient Ephesus (Ayasoluk), which now lies 5 miles from the coast; it was formerly the chief port for both Menderes valleys, but the railway diverted trade to Izmir. The town is partly enclosed by a massive medieval wall extending from N. to S. over the hill.

Raisins, figs, olives, tobacco, sesame, and leather are exported, but the trade of the port is diminishing. Provisions of all kinds can be obtained. There is a modern olive-oil factory.

Port. The anchorage is between Kuşadasi island and a spit extending SW. from Ak Burun, in 15–16 fathoms. It is exposed to all winds from N. through W. to SW.; sea breezes invariably blow between these points by day in summer, almost always causing heavy swell, and the anchorage is unsafe for large vessels. Small coasting-craft obtain some shelter under the lee of Kuşadasi island. There is a small pier at the custom-house with 5 feet depth alongside, used for loading cattle. A quay to the SW. has space for 3 or 4 small lighters alongside, used by sailing-vessels. Larger ships discharge into lighters *c.* 500 yards from the shore. The estimated daily capacity of the port is 150–200 tons.

Communications. Kuşadasi is connected by motor-road with (1) Selçuk (Ayasoluk), 11 miles NE., (2) Aziziye (dry-weather only), 8 miles E., both on the Izmir–Aydin railway (route 17); and (3) Söke, the terminus of a branch line, 12 miles SE.

SIĞACIK (Sighajik; near *class.* Teos). *c.* 38° 12′ N., 26° 48′ E. Izmir vil.

The small town lies in low ground near the head of Siğacik harbour in the NE. corner of Siğacik bay, and N. of a neck of land nearly 3 miles wide which connects a rocky promontory to the W. with the mainland. The harbour is bordered by hills with grassy slopes and scrub except at its head, just N. of the town, which is a small cultivated plain. The town is surrounded by walls, said to be Genoese. It is of some commercial importance, and from it supplies of beef, poultry, fruit, and water may be obtained.

Port. In the entrance to the harbour, depths are from 10 to 14 fathoms. In fine weather, vessels may anchor outside in 15–20 fathoms. The best anchorage, sheltered from almost all winds, is in about the middle of the harbour, in 8 fathoms. There is a good landing-place at the town. Shoal water extends for about 300 yards off the plain at the head of the harbour.

Communications. There is a motor-road E. to Seferihisar, about 3 miles inland, and thence N. to the Urla–Izmir road.

SMYRNA. *See* IZMIR.

TENEDOS. *See* BOZCAADA.

MEDITERRANEAN PORTS

ALANYA (Alâiye, Alaya, Alaia; *class.* Coracesium). 36° 32′ N., 32° 02′ E.; alt. 730 ft. (highest point). Antalya vil.: kaza. Pop. 5,100. Hotel. Barracks. Agricultural bank.

The town rises steeply from a low sandy isthmus, on the rocky E. side of Kaleardi (Dildade) Burun. A plain extends ¾ mile N. to the Taurus foothills. The only drinking-water is obtained from cisterns.

History and description. The town was an ancient stronghold of Cilician pirates. It was reoccupied by Ala-ed-din (1245–50). Later it became the Castello Lombardo (Castel Abaldo) of the Venetians, until 1471. The promontory is precipitous on the W. and S., but on the N. and E. the fortress is well preserved, with a vaulted sea-wall and three upper lines of defence. An Octagon Tower lies on

the N. side of the town. The older houses are built on a succession of ledges, and the streets are narrow and winding. The *konak*, barracks, and bazaar are on the isthmus. The modern houses extend S. of the town into a plain covered with orchards, gardens, and vineyards.

Trade. The main products are oranges, lemons, and sesame. Cattle and vegetables are obtainable. Pine- and walnut-timber and liquorice are the chief exports, but trade has decreased since 1935. Small boats are built in the five vaults of the sea-wall.

Port. There is anchorage in the roadstead E. of Kaleardi Burun, in 6 fathoms. Surf is dangerous during S. winds, especially in winter. Landing is possible from small vessels at a rough stony beach S. of the Octagon Tower, in calm weather.

The climate is mild and healthy.

Communications. An all-weather motor-road is under construction along the coast NW. to Manavgat for Antalya. There is a path SE. to Anamur and Silifke, and paths lead N. through the Taurus ranges to Bozkir and Beyşehir.

ANAMUR (*class.* Anemurium). 36° 06′ N., 32° 50′ E. Içel vil.: kaza. Pop. 1,900.

The town lies 6 miles NE. of Cape Anamur, about 2 miles inland, between the Sultan and Tatlisu rivers. There is a large old castle near the town, and remains of the ancient city cover C. Anamur and the vicinity.

Trade. Anamur is a minor port, fifth in importance on the Mediterranean coast of Turkey. It exports local produce. Cattle are obtainable. Iron and other ores are reported in the neighbourhood, at Çaglayik.

Port. There is good anchorage for ships with local knowledge on the E. side of C. Anamur, sheltered from the fresh westerly seabreeze. A sandy beach extends 6 miles between the town and the cape.

Communications. There is a coastal track NW. to Alanya and NE. to Silifke and Mersin. Paths lead N. into the wooded Taurus mountains.

ANDIFLI (Andiphilo, Kaş; *class.* Antiphellus). 36° 12′ N., 29° 40′ E.; alt. 850 ft. Antalya vil.: kaza. Pop. 850.

The town stands at the head of Port Longos, on the N. side of the Gulf of Castellorizo, sheltered W. by the Vathi peninsula, SW.

by Castellorizo (Meis) island, and E. and SE. by the seaward end of the Kiran Dağ. Local produce is exported, and there is charcoal traffic with Castellorizo.

Port Longos affords anchorage to small ships with local knowledge. Tracks lead NW. to Fethiye, NNE. to Elmali, and ENE. to Finike. There is a cable to Castellorizo.

ANTALYA (Adalia; *class.* Attalia, Satalia). 36° 53′ N., 30° 45′ E.; alt. 121 ft. (met. stn.). Vil. cap. Pop. 23,000. Iş, Agricultural, and Ottoman banks. Hospitals (2). Hotels (3). Garages (2). Barracks (2). Bourse. Meteorological station. Hydro-electric station (medium).

The town stands on cliffs around the port, a deep cove opening WSW. into the N. of the Gulf of Antalya (I, photos. 37–9, p. 94). It is intersected by the western channels of the Devrense (Düden) river, and is 5 miles W. of its eastern mouth. Steep cliffs extend 4 miles W. and 10 miles SE., with a deep gorge W. of the town. The water-supply is plentiful, by aqueduct from the Devrense river; drinking-water should be boiled. Malaria is severe, from river-marshes and rice-fields, though reduced by government measures since 1932. The town is surrounded by an ancient ditch, rampart, and towers. Most of the houses are mean, rising closely above one another, and the streets are narrow; the better houses and the government offices are outside the town. Large State Agricultural buildings lie to the E. There are barracks in the town and others lie 3 miles E. on the Manavgat road (fig. 18). A new hospital has recently been finished.

History. The town was founded by Attalus II of Pergamum (159–138 B.C.) Historical routes served it and its lowland from Afyonkarahisar through Burdur and from Konya through Akşehir and Isparta. The port was used by the Crusaders, but was occupied by the Seljuk Turks in 1211, and by Murad II (1421–51). The walls, which date from the Byzantine period, were restored by a *derebey*, Tekke Oğlu, in the eighteenth century. There was a Levant Company Agency until 1825. There are many Seljuk and Ottoman remains, and a museum. Italian troops landed in the spring of 1919, but Italy lost interest in Antalya after June 1919 and withdrew in June 1921.

Trade. The neighbourhood is fertile and cultivated. There is an experimental farm 10 miles E. on the Karametli river. Hemp and jute are grown locally, and a jute factory is planned. There is one very large modern flour-mill, and 5 or 6 small water-driven mills on the E. coast-road. A rice-mill, driven by electricity, lies near the

sub-power station. Fresh provisions are obtainable; there is a small ice-plant, and snow is conserved for use in summer. The medium-sized light and power station, driven by Devrense river water, is 1½ miles E. of the town, on the sea-front and exposed to waves in S. gales: a larger station is proposed. There are manganese deposits and a chrome mine in the neighbourhood. Unskilled labour is available in small quantities.

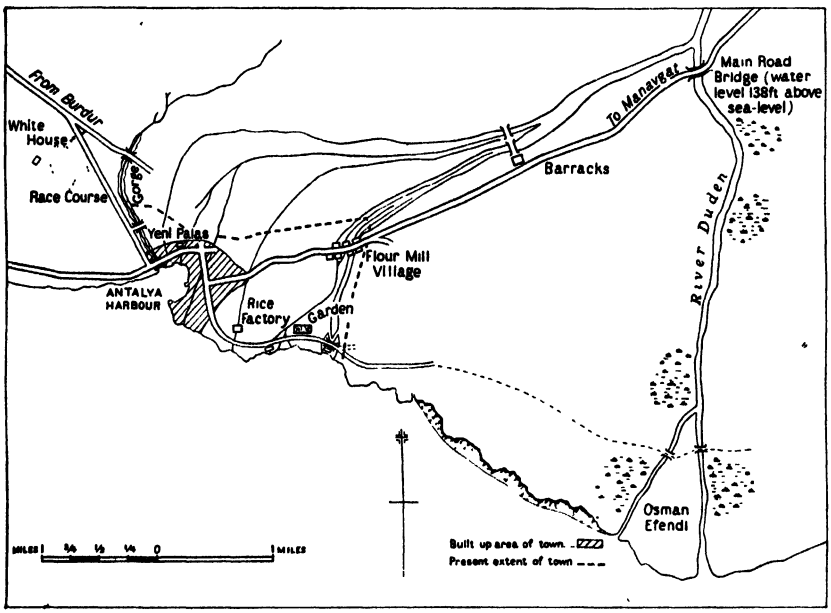


FIG. 18. *Sketch-map of Antalya*

The port is third in importance on the Mediterranean coast of Turkey. It mainly handles exports, which include cereals, flour, fruit, eggs and poultry, timber, firewood, charcoal, goatskins, beeswax, honey, oilcake, sesame oil, liquorice root, and chrome. Imports are manufactured goods and metal-ware, rice, coffee, sugar, petroleum, wines and spirits.

Port. In the open roadstead there is good anchorage for 6 ships in summer; it is unsafe in winter. The usual anchorage is within 600 yards of the shore, in 15–20 fathoms, with the hospital (W. of the town) bearing N. and the old tower (E. of the harbour) bearing SE.

The inner harbour has an area of about 15 acres, and depths of 6–8 feet, obstructed by rocks; it is screened by a ruined breakwater,

with ancient forts on the cliff N. and S. of the entrance. Round the N. side of the harbour is a Customs Quay (430 ft. long, depth 4 ft. alongside), at the foot of precipitous cliffs; on the S. side is a shelving beach, where local craft are drawn ashore; there is a small jetty in the centre of the harbour.

Goods are discharged into lighters in the open roadstead 300 to 400 yards from the shore, and rowed to the Customs Quay except in bad weather, when towage is necessary. There are no cranes, except a small pair of davits at the end of the jetty, so all heavy loads have to be rolled ashore. The inner harbour is used only by sailing-vessels.

The daily capacity of the port is estimated at a summer maximum of 300 tons. In the roadstead, 6 ships can be handled at a time in summer and 2 in winter; 1 ship of 150 tons in the inner harbour.

There is one warehouse of 1,500 tons capacity and another of 500 tons, as well as small sheds near the quays. There are no stocks of coal or oil, which have to be brought by sea. Water is reported to be laid on to the quay: it could easily be obtained from a canal close by.

Landing is possible at the quay in the N. part of the harbour, or on the beach in the S., in fine weather or with off-shore winds. The steep cliffs prevent landings for 4 miles W. and 10 miles SE. of the port.

Climate. Winters are wet and mild: m.d. min. 42°, with occasional frost and fog; the worst weather is in March and April. Summers are dry and hot: m.d. max. 93°. The average annual rainfall is 42 inches: none from May to September. S. and SE. winds prevail in autumn and winter, moderate N. winds in summer. The climate is similar to that of the French Riviera.

Communications. A regular steamship line connects Antalya to the principal ports of Turkey (Istanbul, Izmir, Mersin, &c.). A motor-road, which forms the second section of the Izmir–Antalya trunk road, leads NW. across the Taurus ranges through Korkuteli, Tefenni, and Denizli to Alaşehir, metalled as far as Korkuteli. A second motor-road branches from this 6 miles NW. of Antalya and goes N. to Burdur, with a branch to Isparta, both of which have railway connexions with Izmir and with trunk lines on the plateau. Bus services use both the Burdur and Isparta roads, and an extension of the railway is projected from Burdur to Antalya. To the east a new all-weather motor-road follows the coastal plain to Manavgat and then turns inland across the Taurus to Konya. An extension along the coast from Manavgat to Alanya is under construction.

AYAŞ (*class.* Aegae, Aegaeae; 'Layas' of Marco Polo). 36° 46′ N., 35° 47′ E. Seyhan vil. Pop. 3,200. Hotel.

The town is on a promontory N. of the entrance to Yumurtalik bay, which opens E. into the Gulf of Iskenderon and is sheltered

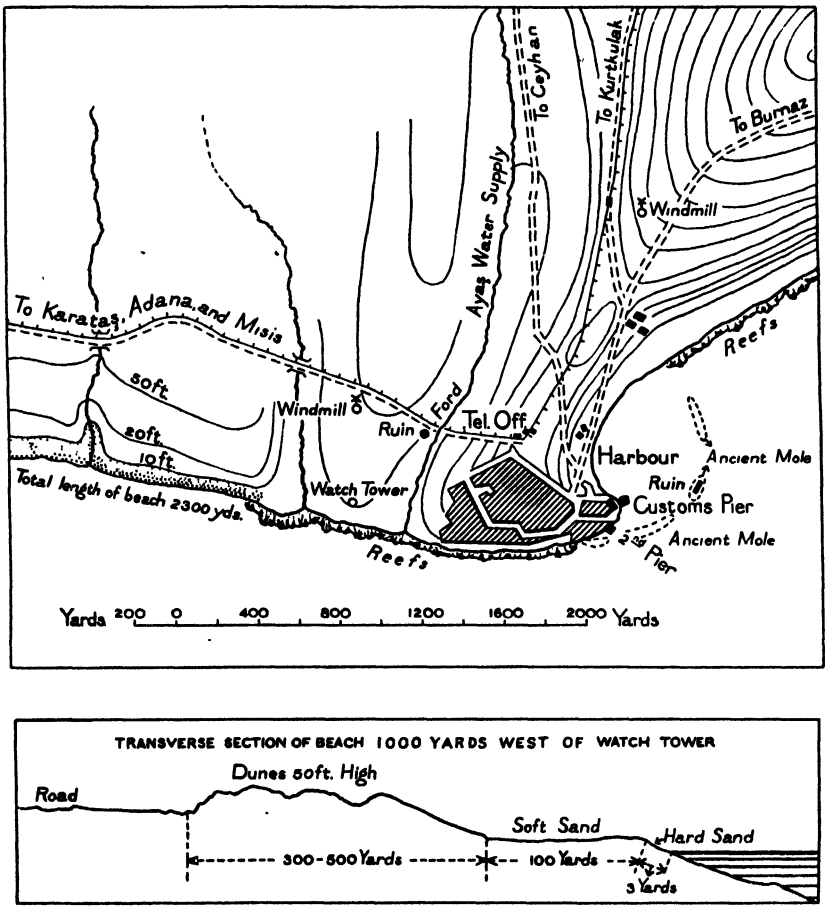


FIG. 19. *Sketch-map of Ayaş*

from the SW. by the Ceyhan delta (fig. 19). The ancient port was a Roman naval station, and was much frequented during the Middle Ages. Ayaş was formerly the chief port of SE. Cilicia, but much trade was diverted to Iskenderon by the opening of the Toprakkale–Iskenderon railway (route 20) in 1913. The older town is near

the medieval castle at the W. end of the harbour. The houses are of solid stone and mortar, from ancient buildings. Suburbs extend to low hills lying to N. and NE. Water is fetched from a shallow stream 250 yards W. of the town, and there is a brackish well in a compound 300 yards E. of the town. There is no fever. Ayaş used to be visited in winter by H.M. ships.

Trade. There is cultivation and pasturage on the coastal plain. Grain and other local products are exported, although the harbour is silting up. There are soda-water and ice factories, a flour-mill and bakeries. Fuel is obtained from scrub on the cliffs to NE. Wild fowl, game, fish, and turtle are plentiful.

Port. There is anchorage in Yumurtalik bay in 4 to 10 fathoms, sheltered from all but E. and SE. winds. N. winds may lower the sea-level 2½ feet. Ayaş harbour is small, with depths of 3 to 15 feet, and is fast silting up. It is protected by ancient moles. There are two rough stone piers in the SW. part of the harbour, used for the transhipment of grain into small local craft. The Customs pier, to NE., is 20 feet long, and the SW. pier is 30 feet long; both piers have 5 feet of water at the head, shoaling to 2 feet. There are no lifting appliances. The daily capacity of the port is estimated at 150 to 200 tons. The Custom-house and storehouses (80 yds. long) are at the inshore end of the Customs pier. There are warehouses in the centre of the town and 300 yards E.

Climate. The climate is healthy, with a cool sea-breeze in hot weather; sudden NE. gales occur during winter.

Communications. Dry-weather cart-tracks lead N. over the Misis hills to Ceyhan for Adana, NW. to Misis, SW. to Karataş and Mersin, and NE. round the head of the gulf, keeping inland behind the marshes, to Payas.

FETHIYE (Fethy, Makri, Makry; *class.* Telmessus). 36° 37′ N., 29° 06′ E. Muğla vil.: kaza. Pop. 3,850. Agricultural bank. Hotels. Hospital. Electricity station (small).

The town stands on the S. shore of its landlocked harbour, which opens NW. into the Gulf of Fethiye, and on the S. side of the Karavaseri stream which enters it from the E. (I, photo. 36, p. 94). Across the entrance to the harbour lies Meğri island or Fethiye Adasi (Eski Makri; Cavaliere Island, 110 ft.), covered with medieval ruins. A medieval castle stands on the citadel hill, and there are many ancient tombs and other remains. The district is marshy and

malarious, and in summer almost deserted. Water is plentiful in winter, from ravines on the W. side of the harbour, a spring in the market-place on the quay, and several good springs behind the town; the clear water that issues from the rocks near the ancient theatre is unwholesome.

The town consists largely of huts, with some modern commercial buildings along the sea-front; and the French chrome-mining company has built modern dwellings and a hospital for its employees.

Trade. The port is seventh, in the value of its trade, on the Mediterranean coast of Turkey. It exports chrome from rich mines inland, cereals, beans, tobacco, and valonia. Manganese mining is centred at Üzümlü, 12 miles NE. Provisions are obtainable, and the harbour abounds with fish.

Port. Fethiye harbour affords excellent landlocked anchorage about 2 miles long and ½ mile wide, secure from seaward observation; it would be suitable for seaplanes. The SW. entrance to the harbour is 500 yards wide and 14 fathoms deep, and the NE. entrance is 300 yards wide and 8 fathoms deep. Anchorage is in 7–13 fathoms, near the W. shore to avoid a mudbank which extends from the marshy E. shore, for 400 yards in the N. and for more than ½ mile in the S., abreast the town. There is a quay about 220 yards long with 23 feet alongside. It was reported in 1938 that ships load alongside a jetty, consisting of a sunken vessel, at Vuruk point, about 350 yards SE. of the NE. point of Meğri island. The daily capacity of the port is estimated at 200 tons.

Communications. The new Izmir motor-road leads NW. through Köyceğiz, Muğla, and Aydin, and eastwards to Kemer, whence a continuation is projected to Andifli. The road is expected to increase the trade and to improve health conditions in the town. From Kemer a stone-built road, passable for light traffic in all weathers, goes N. to Tefenni on the Izmir–Antalya road. There is a track NE. to Üzümlü.

FINIKE (Fineka, Phineka). *c.* 36° 18′ N., 30° 08′ E. Antalya vil.: kaza. Pop. 1,250. Hotels (2).

The town lies NW. of Finike bay, N. of Gök Burun and by the mouth of the Yaşgöz river. The N. shore of Finike bay is low and sandy. Steep hills rise to W. and S. Finike castle is S. of the town. There was formerly a large Greek population.

Local produce is exported. Water and provisions are obtainable. There are 4 flour-mills.

Port. The roadstead is shallow and exposed to S. winds, and the sea is rarely calm. Ships anchor about 1,300 yards from the shore and discharge by lighters. There is a small mole. The estimated daily capacity of the port is 100 tons. Landing is possible at the mole and on the N. shore of Finike bay.

Communications. Except for a road, reported fit for traffic in all weathers, which leads N. through Elmali to Korkuteli on the Alaşehir–Antalya road, Finike depends almost entirely on the sea for its communications. Only hill-tracks lead NE. to Antalya and WSW. to Andifli.

ISKENDERON (Iskanderun, Alexandretta; *class.* Alexandria ad Issum, Myriandrus). 36° 37′ N., 36° 08′ E.; alt. 7 ft. (rly. stn.). Hatay republic: cap. Pop. 14,000. Banks. Hotels, garages (3), restaurants. Hospital. Barracks. Electricity station (medium).

The town is on the S. shore of Iskenderon bay, which opens N. into the SE. side of the gulf (figs. 20, 21; photo. 28, p. 102). It is built on a coast strip of sand and shingle about ½ mile wide and is cut off by marshes and pools from the cultivated land at the foot of the Gâvur Dağ; in summer the higher parts of the marshes are maize-fields and pasture. W. of the town there are villages with poplar groves in the low ground. Good drinking-water is brought in pipes from a spring 1 mile S. of the town. Sanitation is bad. There was an outbreak of plague in 1920–1, and a typhus epidemic in 1923. Malaria is severe, although improved by drainage, and in summer the Europeans and richer people live in hill stations such as Nergislik and Sogukoluk. Mosquito-nets are essential.

History and Description. Myriandrus, whose site is close to the town, was a Phoenician city. Alexander founded a town adjacent to Myriandrus after his victory over Darius at Issus in 333 B.C. It was destroyed by the Persians in the third century A.D. After the Arab conquest it became known as Iskandariyah, and was taken several times by the Byzantines. Later, it became prosperous as the port for the flourishing city of Aleppo. Under the French it was capital of the Autonomous Sanjak of Alexandretta (the Hatay), which was ceded to Turkey on 23 June 1939.

The principal street runs N. and S. and is the continuation of the road from Aleppo. There are several metalled side streets, and a well-kept boulevard runs E. and W. along the sea-front. Houses, with tiled roofs, spread alongshore and inland along the main roads.

Trade. There is an annual traffic of about 100,000 tons. The

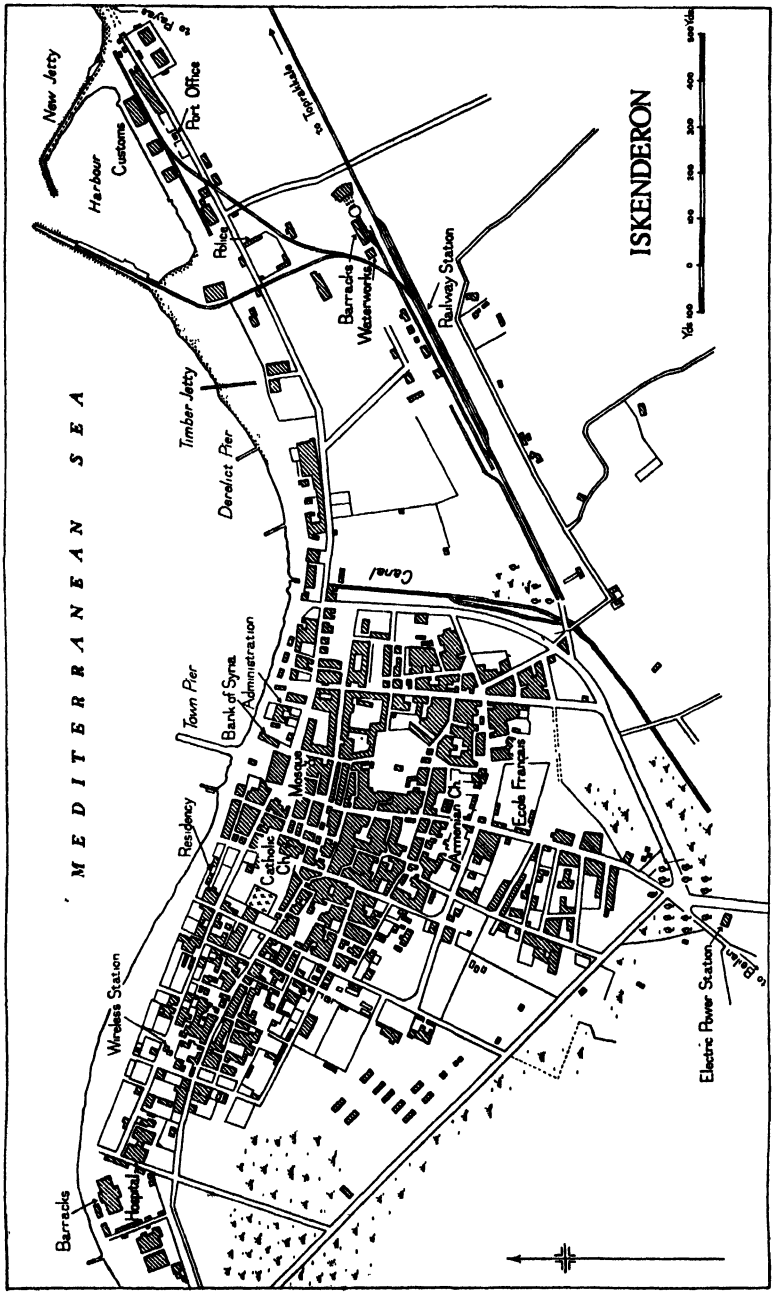


FIG. 20. *Plan of Iskenderon*

harbour was built by the French as the port of Aleppo, and is inadequate for the increased volume of traffic since its cession to Turkey in 1939; it is in process of reorganization. A firm of British consulting engineers has prepared a project for a new port at an estimated cost of £600,000. Chrome exports have now ceased from Iskenderon because of congestion, and the ore is exported from Mersin instead. Exports are wool, cotton, cereals, wax, hides, olive-oil, oranges, liquorice root, apricot kernels, poppy seed, livestock, and manufactured goods. Imports include manufactured goods, rice, sugar, coffee, salt, copper, iron, hardware, leather, cloth and yarn, indigo, cochineal, and skins. Provisions are plentiful. There is an ice factory 500 yards W. of the harbour, and cold storage. The electricity plant is S. of the town; the supply is inadequate, only lighting the streets and main buildings. Antimony, manganese, chrome, boracite, and bitumen are found in the neighbouring hills.

Port. There are 4 square miles of anchorage in the bay N. of the town, sheltered from all but N. winds. The usual anchorage is about ¼ mile off shore, in 7 fathoms. Cargo is transferred by lighter.

There is a small enclosed harbour about ½ mile E. of the town facing NW. It is protected by two moles, about 900 feet long, with an entrance 150 feet wide, and a quay in the S. The harbour is badly silted, the water shoaling to a sandy beach in the SW. corner, and it can only be used by lighters and small craft, which discharge alongside the moles or at the S. quay. The W. mole is connected with the main railway.

There are three jetties abreast of the town. The West Jetty is 300 feet long with 11 feet of water at the head, shoaling to the beach, and has a decauville line; it is used for exporting liquorice. The Town Jetty is 240 feet long with 7–11 feet of water at the head, shoaling to the beach; there are berths for two lighters each side; goods are manhandled from the head; it has a daily capacity of 200 tons; water is laid on. The East Jetty is 220 feet long with 7 feet of water at the head, shoaling rapidly to 3 feet; it has a double decauville line, and a daily capacity of 100 tons.

A new large pier is under construction, about 1,300 feet long with 30 feet of water at the head; it will accommodate the largest ships using the E. Mediterranean.

There are 2 cranes on the W. mole and 3 on the S. quay of the enclosed harbour, all in bad condition. There are 10 tugs and 40 lighters. Several large warehouses, with a capacity of about 1,200 tons, face the quay. The capacity of the port is limited by the railway

and by the deficiency of lighters and heavy cranes, though partly remedied by the transfer of heavy pontoons from Istanbul; at present it is estimated at 600 tons a day; the maximum, with improvements, will be 2,000 tons a day. There is a coal dump between the harbour and the station. There are two oil stores, with canning plant and jetties, on the E. shore of the bay about 2 miles from the town.

Landing is possible on the moles or in the harbour.

Climate. Winter is cool and moist, but summer very hot. In January and early February, the weather is fine, though interrupted

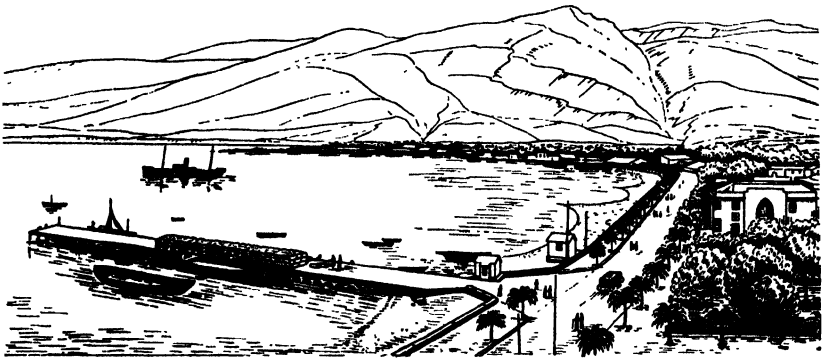


FIG. 21. *Iskenderon*

by N. gales which raise surf on the beach and interfere with lighterage work in the port. From the middle of February to the end of March, S. and SE. winds prevail. In April, calms prevail, with strong E. gales (*raghiehs*), which are felt in the gulf but not in the anchorage, followed by strong W. winds. From May to August, fine weather prevails, with light SW. winds and land- and sea-breezes. From September to February is the rainy season, calms and light winds prevailing. The mean annual rainfall is 27 inches.

Communications. Iskenderon is the terminus of a single-track standard-gauge railway (route 20) which runs N. through Payas and joins the Adana–Aleppo line (route 9) at Toprakkale. There are motor-roads N. to Payas and S. over the Beilan (Bilan) pass (2,250 ft.) to Aleppo and Antakya (Antioch). Paths lead inland into the Gâvur Dağ and SW. along the coast.

MARMARIS (Marmarice, *class.* Physcus). 36° 52′ N., 28° 16′ E. Muğla vil.: kaza. Pop. 2,600. Barracks. Electricity station (small).

The town is on a small rocky promontory at the head of its fine

harbour, protected southwards by the Ada peninsula which is connected by an isthmus of shingle to the E. side, and by Keçi Ada (Passage Island) lying W. of the peninsula (I, photo. 35, p. 83). The harbour is backed by mountains except in the NW. where there is a small alluvial plain, fertile but not much cultivated. Water is plentiful from two good springs E. of the town and small springs on the W. side of the harbour; in winter it can also be obtained from several small streams from the surrounding mountains.

The town is of poor appearance. There is an ancient fort on a hill



from the west

1¾ miles NW. A conspicuous red mound lies ½ mile N. The barracks are ½ mile W.

Trade. The people are engaged in coastal trade and in fishing. There is a chrome mine near by. Other chief exports are honey, turpentine, and timber, but the annual traffic is small. Beef, poultry, and eggs are obtainable in small quantities. Cattle and provisions can be obtained from the interior, and vegetables in normal times from Rhodes.

Port. The approach to the harbour is through deep-water channels on either side of Passage Island: East Pass is wider and straighter than West Pass. The harbour has an area of *c.* 4 square miles, with good holding ground, free from swell except during S. winds, prevalent in winter. There are no tides, but S. and W. winds may raise the sea-level 2 feet, and N. and E. winds lower it. The harbour has often been visited by H.M. ships. A mole, with a depth of 4 feet alongside, extends from the W. shore of the town. There are no quays, wharves, or cranes. Goods are discharged by lighters, *c.* 100 yards from the shore. The estimated daily capacity of the port is

not likely to exceed 150 tons after allowing for bad weather during the winter. Landing on the beach is possible in the NW. part of the harbour, but the defences on the Ada peninsula could effectively cover all the beaches inside the harbour, and also those close outside.

Climate. The climate is healthy. In winter, S. winds prevail, with thick weather, and occasional severe gales. In summer, land- and sea-breezes are usual, with hazy weather in the hottest months.

Communications. A motor-road leads to Muğla (25 miles N.) on the Izmir–Fethiye trunk road, and an earth road leads to Datça (35 miles W.) in the Reşadiye peninsula. There are tracks W. to Bordont bay, SW. into the Darhayabe peninsula, and E. along the coast to Karaağaç harbour and on to Dalaman and Fethiye. There is a cable to Rhodes, and daily sea communication in normal times and good weather.

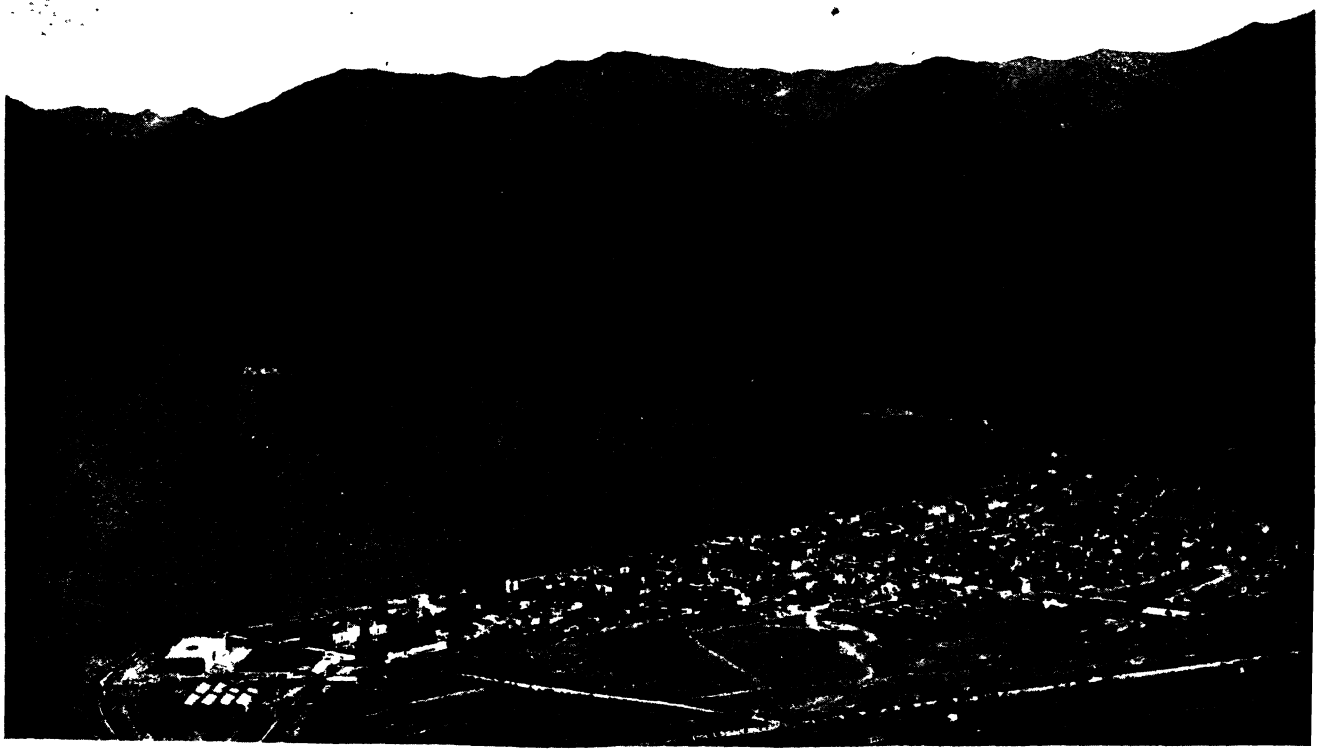
MERSIN (Mersina, Mersyna, Içel; *class.* Zephyrium). 36° 48′ N., 34° 37′ E.; alt. 20 ft. (rly. stn.). Içel vil. cap. Pop. 30,200 (1940). Iş, Agricultural and Ottoman banks. Bourse. Hotels (8), restaurants, garages. Hospital. Barracks. Electricity station (medium).

The town lies NE. of the mouth of the Efrenk (Afranenk) river, in the SW. of the fertile Cilician lowland, at the head of a wide bay opening SE. Water is plentiful, through underground pipes from the river and also from wells: it is drinkable if chlorinated. Malaria is severe in summer, when most European residents move to Gözne, a hill station about 13 miles N.

History and Description. Mersin flourished after the silting of Tarsus and Pompeiopolis in the early Middle Ages. It came under temporary Egyptian domination in 1832 when Cilicia was occupied.

The town is well built, with new custom-house and railway terminus. The streets are wide and paved. There are good stone houses in the central squares, a stone-built bazaar, and a new quarter along the beach to the W. There is a fire-station, with three engines, in the centre of the town. The Turkish Naval College and Petty Officers' School has recently been transferred from Halki (Princes' islands).

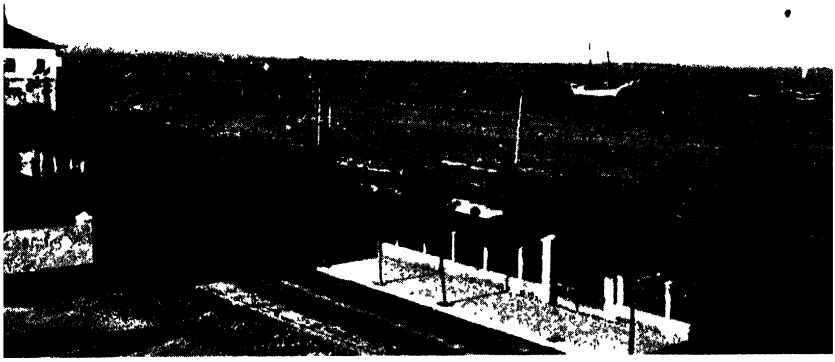
Trade. Much cotton is grown with irrigation in the district, and cereals are also important. Fruit is grown on the outskirts and honey is produced. Fresh provisions are plentiful. There are two cotton-seed crushing-mills (one in the town and the other to the E. near the railway), cotton spinning and weaving mills, olive-oil presses, a soap factory, a flour-mill and large bakehouse, a rice-mill in the



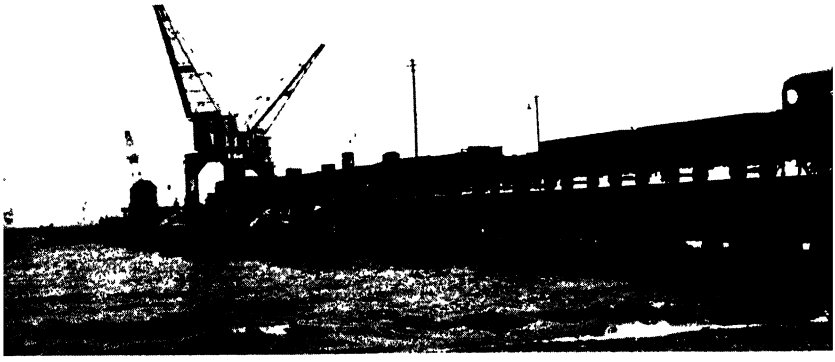
28. *Iskenderon from the air*



29. *Mersin piers from the south-west*



30. *Mersin roadstead from the west*



31. *The Railway Pier, Mersin*

centre of the town, a saw-mill 4 miles W., and three small ice factories and small cold store; the medium-sized electricity station is on waste land N. of the railway station; a slaughterhouse and meat factory were planned in 1938.

Mersin is the third port of Turkey, and has a position of strategic and economic importance at the seaward end of railway routes to the central plateau and eastern and south-eastern Turkey. An extension of port facilities is projected. The principal exports are chrome ore from Güleman, copper from Erganimadeni, cotton, cotton-seed oil and cake, and grain. Other exports include sesame, sesame oil, yellow dye-berries, gum, eggs, poultry, cattle, sheep, and goats. Imports include coal from Zonguldak, agricultural machinery, cars and lorries, and railway material for the extension of the railway from Diyarbekir.

Port. The port is an open roadstead off the town, with no shelter but with good holding ground. There are seven piers, three of which are so dilapidated that they are unusable. Sea-level is not affected by tides, but may be raised 2 feet by S. and W. winds and lowered by the same amount during N. and E. winds. The sea-breeze (*imbat*) in summer raises a nasty short swell, and there is a strong current alongshore during SW. and E. winds. There is a lighthouse at the mouth of the Efrenk river, SW. of the town (fig. 22; photos. 29–31).

The best anchorage is about a mile offshore in 6 fathoms. Only the smallest local sailing-craft can lie alongside the piers, and cargo is transferred in lighters.

The *Railway Pier*, built in 1927, lies about 400 yards SE. of the railway terminus, at the E. end of the town. It is solidly built of reinforced concrete, 499 feet long, 48 feet wide, and 10 feet above the water, with a depth of 13 feet at the head shoaling to the beach. A single line of normal-gauge railway connects it with the junction and diverges into three lines down the length of the pier. There are berths for three lighters on each side, and electric light and water are laid on.

About 50 yards SW. of the Railway Pier is a ruined jetty (*iskele*), only the piles of which are visible.

The *Interior Trade Pier*, or Town Jetty, lies 120 yards SW. of the Railway Pier. It is of light iron construction, with timber decking, 400 feet long, 30 feet wide, and 6 feet above the water. There is a depth of 11 feet at the head, but the pier is dilapidated. A single decauville track gives access to open ground near the normal-gauge line to the Railway Pier.

The *Concrete Jetty*, 500 yards SW. of the Railway Pier, is also

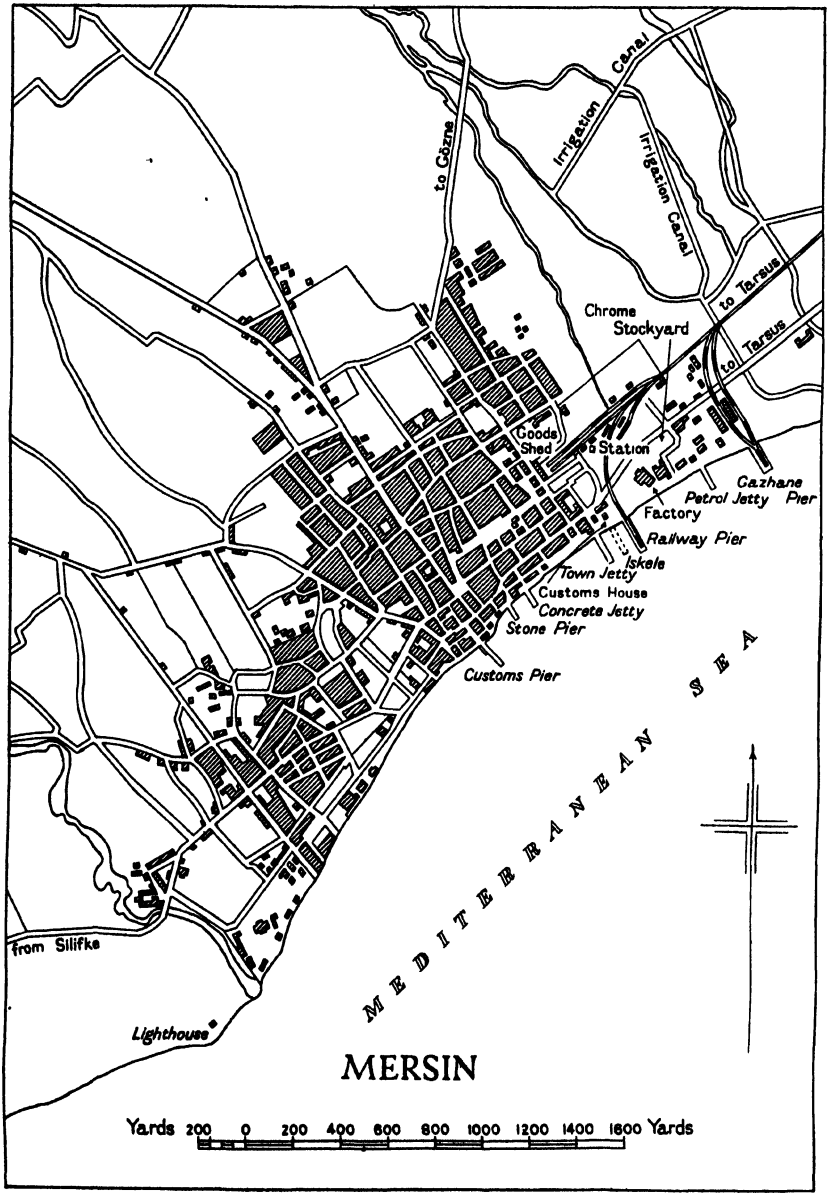


FIG. 22. *Plan of Mersin*

dilapidated. It is 360 feet long, 18 feet wide, 8 feet above the water, with a depth of 9 feet at the head. Three lines of decauville railway are laid semi-flush with the decking.

The *Stone Pier* (Taş Iskelesi), 590 yards SW. of the Railway Pier, is of light iron construction, with timber decking. It is 250 feet long, 18 feet wide, and 7 feet above water, with a depth of 10 feet at the head. A double decauville track connects with sheds on shore, but the pier is unusable.

The *Customs Pier*, 760 yards SW. of the Railway Pier, is an iron jetty with timber decking built during the French occupation of 1918–20. It is 300 feet long, 50 feet at its widest part, and 7 feet above water, with a depth of 11 feet at the head. A single decauville track gives access to the Customs warehouses. Water and electric light are laid on, and there are berths for two lighters on each side. The Port and Health offices lie on the pier, and it opens on to a square surrounded by cafés and stores. It is the main landing-place of the port.

The *Petrol Jetty* is 360 yards NE. of the Railway Pier. It is used for the export of chrome ore, but takes its name from the oil store which lies near its landward end. Constructed of iron, with timber decking, it is 360 feet long, 12 feet wide, and 9 feet above the water, with a depth of 11 feet at the head. Ore is unloaded from the railway and transported in Jubilee wagons pushed by hand on a decauville track to a stockyard. From here it is reloaded into Jubilee wagons and taken along the jetty on a double decauville track on trestles 3 feet above the decking. At present 650 tons of ore can be shipped daily, but if more tugs were available this could be increased to 1,000 tons.

The *Gazhane Pier*, 580 yards NE. of the Railway Pier, is the most easterly of the seven piers. In 1941 it was unfinished, with a gap of 157 feet between the completed seaward portion of 235 feet and the shore. It is constructed of reinforced concrete, and is now (1942) believed to be completed, 392 feet long, 36 feet wide, and 11 feet above the water, with a depth of 12 feet at the head. A single line of railway runs the length of the pier, branching to each side of a large warehouse 94 yards from the landward end, and then joining the main line north of the Adana road.

The estimated daily capacity of the port, without considering the heavy export of chrome ore, is 650 tons of stores, or 450 tons of stores and 65 vehicles. But work at anchorage is hindered on about 100 days a year by winter offshore winds, heavy seas during WSW.–

ESE. winds in summer, and by swell. In 1941 there were 11 tugs and 57 lighters available, and cranes at the same date were as follows: on the Railway Pier, one 5-ton and two 3-ton travelling electric cranes; on the Customs Pier, one 10-ton electric travelling crane, one 3-ton steam crane, and one 2-ton fixed electric crane; on the Interior Trade Pier, one 2-ton fixed electric crane and one hand crane of 10 cwt.

Behind the Gazhane Pier is a modern two-story warehouse, with loading bunks and adequate lifting appliances, served by the railway on both sides. There are other stores and warehouses in the vicinity of the piers, and stacking space round those at the ends of the Railway and Customs Piers, but existing warehouses have proved insufficient at times, and there have been proposals for increasing storage capacity.

Petrol is stored in tins near the Petrol Jetty, and the State Railway keeps in stock about 500 tons of Zonguldak coal. Water is laid on to the Railway and Customs Piers, and there are two water-boats each with a capacity of 25 tons. Skilled and unskilled labour is available; there are building slips and workshops for the construction of lighters, and six rough slips for their repair.

Climate. Winter is wet, with N. and NW. winds, and occasional gales from NE. and E. which may interfere with work at anchorage; fog and mist are rare. Summer is fine but enervating, with winds from SW. to W. and S. to SE.; seas are often heavy; morning mist is frequent; thunderstorms occur in April and May. The mean annual rainfall is 22·6 inches.

Communications. There are regular steamship services to Turkish and foreign ports. Mersin is the terminus of the railway (route 19) which joins the Konya–Adana line (route 9) at Yenice. A motor-road leads NE. through Tarsus to Adana, with a branch from Tarsus through the Cilician Gates to Ulukişla; another motor-road goes SW. along the coast to Silifke. Paths lead inland, NW. and N. into the Taurus mountains and E. behind coastal marshes to Karataş and Ayaş. Emergency air-landing-ground 5 miles E. of the town.

PAYAS (*class.* Baiae; 'Aya' of Crusaders). 36° 46′ N., 36° 11′ E.; alt. 36 ft. (rly. stn.). Seyhan vil.: nahiye. Pop. 6,300 (1895).

The small town lies 1 mile inland of a small sandy bay, surrounded by olive-trees, near the steep W. foot of the Gâvur Dağ. It is 12 miles N. of Iskenderon, at the seaward end of the former frontier between Turkey and Syria. To N. the coast is steep; to S.

it is low and marshy. In 1800 the town was seized by the Turkoman brigand Küçük Ali Oğlu, and was destroyed by the Turks in 1908. The houses are mean, but there are old stone bazaars, a large old *han*, and a convict prison. Inland are the ruins of a church, and a large Genoese fortress. The ancient port is now partly inland, and filled with sand and stones. Drinking-water is plentiful and good from hill streams.

Trade. There was formerly a considerable export of oranges and grain, but the jetties have been allowed to deteriorate, and the port is at present unused. Just before the present war a firm of British consulting engineers advised the development of Payas as an export centre for chrome ore and other minerals. Small quantities of provisions are obtainable in season.

Port. There is anchorage in 8 to 10 fathoms, shoaling quickly to a sandy beach in a small bay sheltered from all but WSW. to SSW. winds. There are two ruined jetties, formerly used by sailing-craft: the N. jetty, with electric light, is 210 feet long with 10 feet of water at the head; the S. jetty, which has a gap of 10 feet from the base to the shore, is 200 feet long with 12 feet of water at the head. There are four good storage sheds inland of the jetties, with a disused decauville track running through each to the S. jetty. Landing is possible in fine weather on the beach or with ladders at the jetties.

Climate. In winter, S. winds prevail; in spring and summer, winds are from W. and NW. Visibility is generally good, with morning and evening mists.

Communications. There is a siding, about 400 yards long, to the Toprakkale–Iskenderon railway (route 20); its terminus is near the storage sheds, but is 40 feet above their ground-level. The station is S. of the town. A motor-road leads S. to Iskenderon, and a dry-weather road leads N. to Dörtyol for Toprakkale, Osmaniye, or Ceyhan. A cart-track leads round the head of the gulf, inland behind the marshes, to Ayaş.

TAŞUCU (Balacale; *class.* Holmi). 36° 18′ N., 33° 54′ E. Içel vil.: nahiye.

The village lies at the head of Taşucu bight, between Ovacik Ada and Incekum (Bağase) Burun, and is the landing-place for Silifke, about 5 miles inland. Provisions can be obtained from Silifke. Large quantities of barley are exported.

Port. Taşucu bight provides anchorage for a large number of

ships, open to the S. There is a jetty (200 ft. long, with a depth of 5–6½ ft. of water at the head) at the village, with a 1-ton hand-crane and a white square building and sheds at the inshore end. Sailing lighters transport barley to ships anchoring off shore in 5½ fathoms. In calm weather or off-shore winds, landing is possible at the jetty.

Communications. A motor-road leads NE. to Silifke for Mersin. There is a path SE. to the lighthouse at the end of Incekum Burun. Taşucu was much used by the Turks during the War of Independence to smuggle in supplies for the Nationalist forces, most of the other ports being closed by foreign occupation.

CHAPTER XIII

MINING

THE mineral resources of Asia Minor were long ill-explored, but a few were discovered and exploited in early times. The alluvial gold of the Pontic rivers, and the local practice (a primitive 'grease-process' which persisted to modern times) of collecting the gold-dust in sheepskins provoked the Argonauts' voyage in search of the 'Golden Fleece' before the Trojan War (*c.* 1230 B.C.). The gold wealth of the Midas dynasty in Phrygia was proverbial, and the Pactolus-gravels at Sardis furnished that of Gyges and Croesus, and led about 650 B.C. to the Lydian invention of coinage, the royal stamp guaranteeing the quality of the nuggets. There were also gold-mines later at Astyra (east of Çanakkale), and under Persian rule Cyzicus (Kapi Dağ or Erdek) became a principal centre of gold and electrum coinage. There was a 'birth-place of silver' in Greek legend, somewhere beyond the Halys (Kizil Irmak), probably the same district (Gümüşane?) that was exchanging silver for Babylonian goods before 2000 B.C. through Semitic merchants at Karahüyük, south of Kayseri.

In classical times silver was mined at Myndus in the peninsula of Bodrum, where the shaft and slag heaps remain. Cinnabar was mined near Ereğli (*Heraclea Pontica*) and mercury was produced. From a great native iron-industry in the mountains north and east of the Central Plateau the Greeks took a local tribe name *Chalyps* as their word for 'steel'; it was indeed probably from this district that the Hittite kings were obtaining the first recorded iron, about 1250 B.C.; that Tyre afterwards obtained its supply of 'bright iron' (*Ezekiel* xxvii. 19), and Damascus the raw material for its sword-blades, which first appear among Assyrian spoils about 730 B.C. Many smaller metal industries persisted into Roman and Byzantine times, and as all mines became imperial domain they passed to the Ottoman Sultans by conquest. But no deliberate search for ore, or extension of known workings, is recorded. Only place-names compounded with *gümüş* ('silver') or *demir* ('iron') mark mining and metal-working settlements; the word *altun* ('gold') is, however, almost always symbolic and has no reference to ancient industry.

Before 1914 mining in Turkey was in the hands of a few companies or persons who had secured concessions, and the industry was conducted in a very haphazard fashion. There were no geological maps

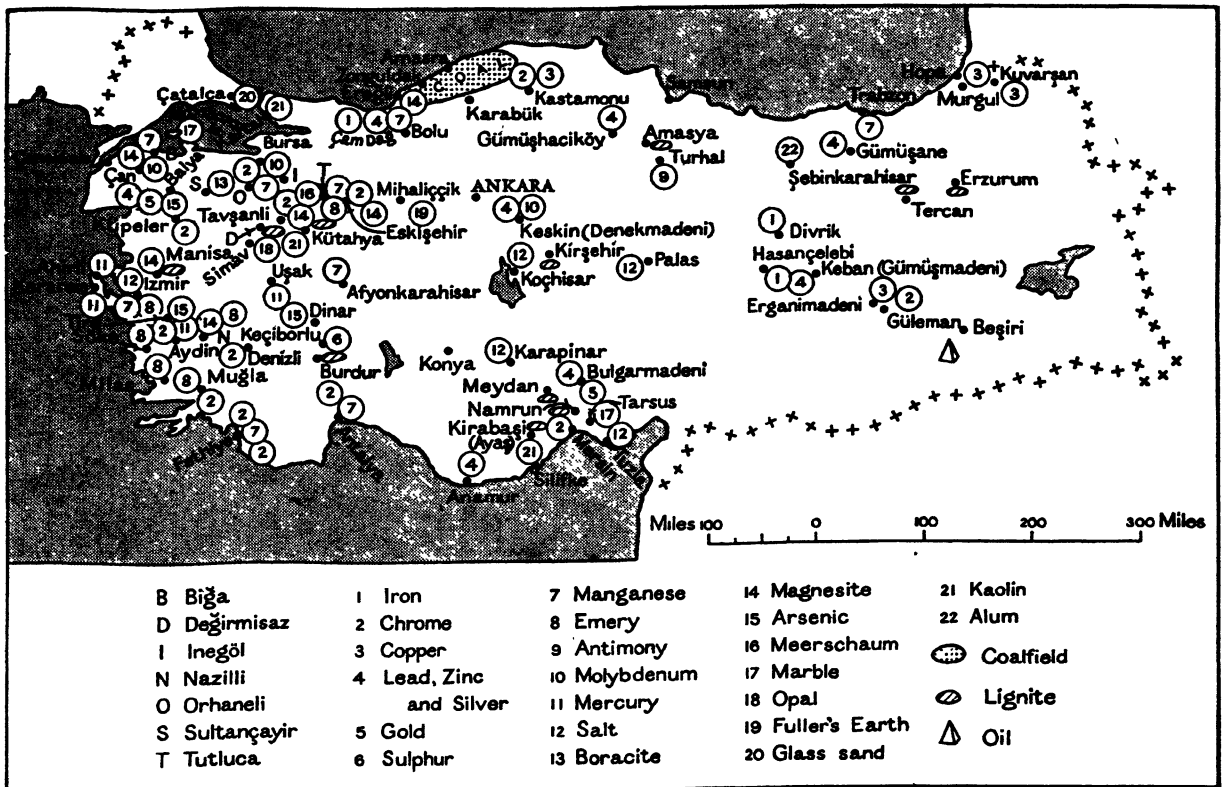


FIG. 23. *Distribution of Minerals*

and no geological or mining survey. Prospecting was systematic in only a few places. During the War of 1914–18 the Germans explored many districts into which chance or reports of mines led them. Since the establishment of the Republic a determined effort has been made by the Government to set its house in order. Following the example of its neighbour, Soviet Russia, Turkey embarked in 1934 upon a Five-Year Plan, in the forefront of which was placed the development of its mineral resources. Under this plan, and supplementary ones in 1937 and 1938, the mining industry has been particularly favoured, its direction being assumed by a special mining department, the Maden Tetkik ve Arma Enstitüsü (M.T.A.), or Institute of Mineral Research. Most of the private mining concerns have been bought out and absorbed by the State, and almost the whole industry has been nationalized. The financial needs of the department have been met by the ample State resources of the Eti Bank (p. 183).

Under the M.T.A., special branches were organized to deal with exploration, development, maintenance, and metallurgy. Most of the Turkish mining engineers are German-trained, and on the central staff of about 200 engineers 15 of the 20 foreign advisers are Germans. New undertakings, sponsored by the M.T.A., are the chrome mines at Güleman in the east, the sulphur mines at Keçiborlu in the south-west, the copper mines at Kuvarşan and Murgul in the extreme north-east and at Erganimadeni on the headwaters of the Tigris. Drilling for oil has been undertaken in European Turkey, and in south and south-east Turkey. Blast furnaces have been set up at Karabük, on the railway not far from Zonguldak (p. 215).

The Five-Year Plan demanded an increased output of coal for home consumption; the development of lignite mines, especially for electrical power; an increase of metal output, particularly that of chrome; and the initiation of an aluminium and magnesium industry.

The location of the chief mines and mineral deposits is shown on fig. 23. A summary of the present state of exploitation of each is given below. Figures must be accepted with reserve.

Coal

There is so far only one important coal-field in Turkey, that between Ereğli and Kastamonu.[1] The seams, numbering about 60 and mostly thick enough to be profitably worked, occur in basins over a distance of nearly 150 miles, the chief mines being at Kilimli,

[1] Coal has been reported at Erzurum and Tercan, but this is probably brown coal or lignite. Details are lacking.

Zonguldak, Kozlu, Kandilli, and Çamli (photos. 32–5); production near Amasra has been suspended lately as the seams are poor. In the Zonguldak basin they occur in a packet of beds 5,000 feet thick, which are mostly sandstones known as the Karadon series. The beds are very similar to the coal measures of the Donetz basin across the Black Sea, and are mostly the same age as the coal worked in Great Britain, but Turkish bituminous coal is said to be superior to that of northern England. Certain deposits recently found are suitable for coking. Reserves are vast, sufficient to last for about a century at the present rate of output. There is said to be a minimum amount of 200–300 million tons,[1] and the total may be much greater as seams are still only worked to a depth of 130 feet, owing to lack of both capital for more extensive exploitation and mechanical mining equipment, and also of pit-props from abroad. It is reported that some galleries are collapsing now for want of props.

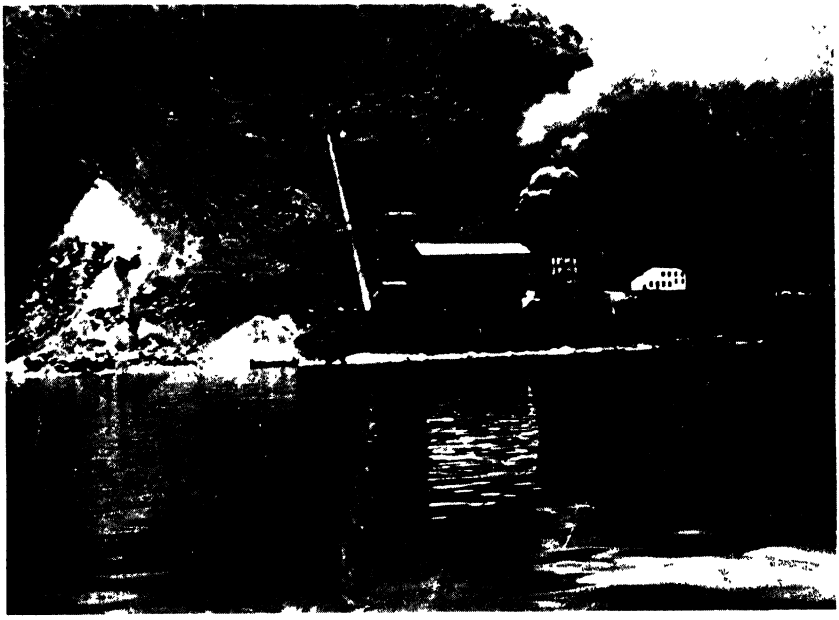
Although the coal was discovered in 1828 and was a perquisite of the Sultan, output remained below 50,000 tons a year for nearly 40 years. For the next 40 years or so it fluctuated widely, under the Ministry of Marine, but from 1908 it rose to 500,000 tons or more annually. After set-backs during the War of 1914–18, production again increased slowly, jumping, with the firm establishment of the Republic, to about a million tons in 1924. Since then the amount has varied, but has had a general upward trend, and in each of the last few years about 3 million tons of crude coal have been raised. Recent figures, which are misleading, include spoil and rock as well as coal. Actual coal output was 1,958,800 tons in 1940, 1,878,900 tons in 1941. Recent distribution was as follows:

	1940	*1942 (estimates)*
Karabük works	267,800 tons	276,000 tons
Railways	459,200 ,,	462,000 ,,
Shipping	176,900 ,,	84,000 ,,
Cement factories	61,500 ,,	64,800 ,,
Military factories	69,170 ,,	63,000 ,,
Electricity stations	137,110 ,,	116,400 ,,
Total	1,171,680 tons	1,066,200 tons

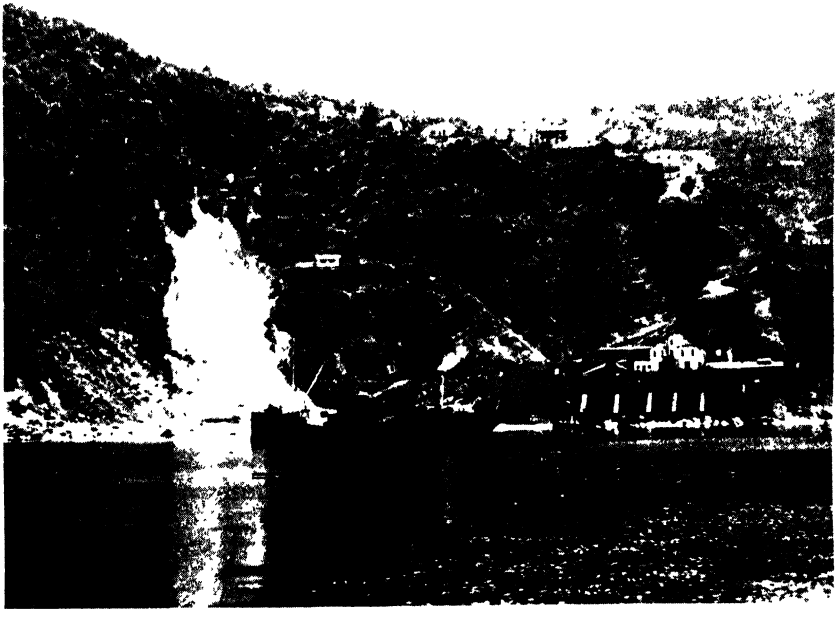
The balance goes to gasworks, other industries, and private consumers. Of the total annual output, about 60 per cent. comes from the Zonguldak–Kilimli region, 30 per cent. from Kozlu, and 10 per cent. from Ereğli.

These large demands by the home market explain why, in spite

[1] Figures in this chapter are metric tons, unless otherwise stated.



32. *Kandılli Coalmine*



33. *Çamli Coalmine*



34. *Zonguldak. Overhead Coal-conveyor*



35. *Gelik Coalmine*

of expanding production, exports have remained relatively small—about 355,900 tons in 1938 and 202,100 tons in the first 9 months of 1939, after which exports were banned because of the war. Shipment of coal from local ports is restricted by poor transport between pit and coast, by bad weather on about 150 days of the year, and at present by war-time dangers, but 4,000 tons are still shipped daily from minor ports on the coal-field—Amasra, Kireçilik, Kilimli, Kozlu, Kandilli, and Çamli, although they have only open roadsteads and few facilities. It was reported in August 1942 that, to improve transport, aerial rope-ways were to be made between the port of Ereğli and the pits at Kandilli, Çamli, Kireçilik, and Telende.

Apart from the lack of capital and pit-props already mentioned, there are two other serious problems in Turkish coal-mining. One is the shortage of labour, now aggravated by mobilization. Many of the men will only work underground for part of the year, returning to their farms for the harvest. Students sometimes work in the mines in holiday time, but this spasmodic and unskilled labour is unsatisfactory. Another scheme, said to be very successful, is to employ willing convicts with a good prison record, and to bank their wages until their release. It is said, however, that the Eti Bank, which took over the mines for the State in December 1940, has had to employ compulsory labour so as to avoid recurrent shortages.

The second difficulty is that much of the coal is fragile and crumbles in the washery. To reduce this waste the slack is used for briquettes, but still about a third of the total tonnage mined is lost.

When equipment and labour organization have been improved, however, Turkey's coal-mines, with their large reserves, should be an important asset in the development of her economic plans.

Lignite

Lignite occurs in Tertiary strata in many districts, often associated with salt springs and gypsum beds. Although outcrops are known at many isolated spots, the quality is variable and the quantity usually too small to work profitably, especially where the beds are broken up. Scientific prospecting has recently been undertaken, and in promising localities production-plant is being installed. Small pits, each producing less than 100 tons a month, are worked in twenty or more scattered districts, especially the Taurus mountains, to provide fuel locally, but the main output comes from mines conveniently situated near Amasya, Manisa, Değirmisaz (Kütahya vilâyet), Kir-

şehir, and Kütahya, the last being by far the most important. Reserves at Kütahya are estimated at 1,000 million tons, 65 million being in the Seyitömer seam alone. The calorific value is also said to be high. Production has increased steadily and everything is being done by the State to increase production. The goal in view is a million tons a year. It is proposed to build a large electricity plant at Kütahya, since the lignite deposits here would provide the most economical source of power in Turkey.

Oil

In common with other minerals, oil has been sought for in Turkey in recent years. Shows of oil are known in Europe near the Sea of Marmara, at some points in central and eastern Anatolia associated with the Oligocene gypsum and salt deposits, and at some places in south and south-eastern Turkey. The M.T.A. has carried on a drilling campaign, particularly in south-eastern Turkey where geological structures resembling those containing the oil in Iraq have been located. After several dry borings, a well at Raman Dağ, nearly 10 miles south of Beşiri in Siirt vilâyet and on the left bank of the Tigris, is reported to have given a small production. The well is located on an ideal anticlinal structure between the lower Batman and Garzan streams. At a depth of 3,444 feet oil came into it and rose on water to within 450 feet of the ground. By pumping, the well was induced to yield from 100 to 360 cubic feet of oil daily, together with about three times this volume of water. The structure is 25 miles long and about 6 miles across, so that there is ample room for a large volume of gathered liquid. Two other wells are now being worked, one at a depth of 1,280 feet to the north, and the other 1,640 feet deep to the west. There are other similar folds in the district, especially to the south, which certainly should not be dismissed without test-drilling. A year or two must elapse before the importance of the wells can be gauged definitely.

Five wells were drilled near Mürefte on the northern shores of the Sea of Marmara as early as 1914, and since 1935 twelve new ones have been completed. The deepest reached 1,087 feet. Traces of oil and gas were found, but there was nothing of economic value, nor does the visible structure make it a very likely neighbourhood, although the series of shales and thin sandstones may contain small pockets of hydrocarbons.

A deep well was also drilled in the neighbourhood of Adana on the lower slopes of the main Taurus, but technical difficulties have

occurred from the shale, which swells and heaves in the hole during the drilling, thereby defeating the attempts to go deep.

Oil-shows, especially round Sivas, are known, in thin limestones associated with red shales and gypsum, but it is unlikely that oil will be found in commercial quantities.

Iron

Turkey's aspirations to have her own heavy industries led her to erect blast furnaces at Karabük in the hinterland of the Zonguldak coal-fields before any national source of iron ore was known. The M.T.A. has been fortunate in locating a large deposit of magnetite, capable of being easily worked and transported, near Divrik (Divriği) on the railway between Sivas and Erzincan (photo. 36). The ore is in the Demir Dağ, between 4,800 and 5,500 feet, and about 4 miles north-west of Divrik. In full production, the mine yielded about 350 tons daily; no machinery except crushers is used in extraction, and there is no aerial rope-way. Reserves are known to exceed 7,000,000 tons and are estimated in one report[1] at 30,000,000 tons, of which two-thirds of the total weight is iron. The crust analysed in 1938 yielded an iron content of 67 per cent., with only 0·05 per cent. sulphur, an exceptionally high quality ore; but further mining has revealed a progressive increase in sulphur content, an average of about 1·8 per cent. for the whole ore body (iron containing over 3 per cent. sulphur is generally considered useless), and special treatment is essential. Turkey unfortunately has not the necessary plant for such treatment so that production is now (1942) facing a serious setback. Large stocks of good ore, however, are reported at both Divrik and Karabük. The main disadvantage is the long distance between the ore and the coal near Karabük which involves a haul of over 600 miles by rail.

Other deposits, said to have been discovered by the M.T.A., are being investigated as additional sources of supply, and might even yield a surplus for export in the future; but at present they are too far from transport routes to be economically exploited. These deposits are as follows:

1. At Çamdağ, near Adapazari, iron carbonate and silicate form ore in beds from 5 to 12 feet thick over an area of about 100 square miles. The occurrence is comparable in character with the iron ore in the Cleveland hills of Yorkshire, although it occurs in a very broken state owing to the strong disturbance which the Devonian

[1] *Journal of the Chamber of Commerce and Industry of Istanbul*, March 1942.

strata have experienced. Improved navigation on the Sakarya has been suggested to enable this ore to be transported to the coast and thence to the Karabük region. Messrs. H. A. Brassert & Co., of London, who supplied the Karabük machinery, favour the exploitation of this deposit as an alternative to that at Divrik.

2. At Hasançelebi, east of the Malatya–Sivas railway, a strip of country about 3 miles long is mineralized with haematite. The ore

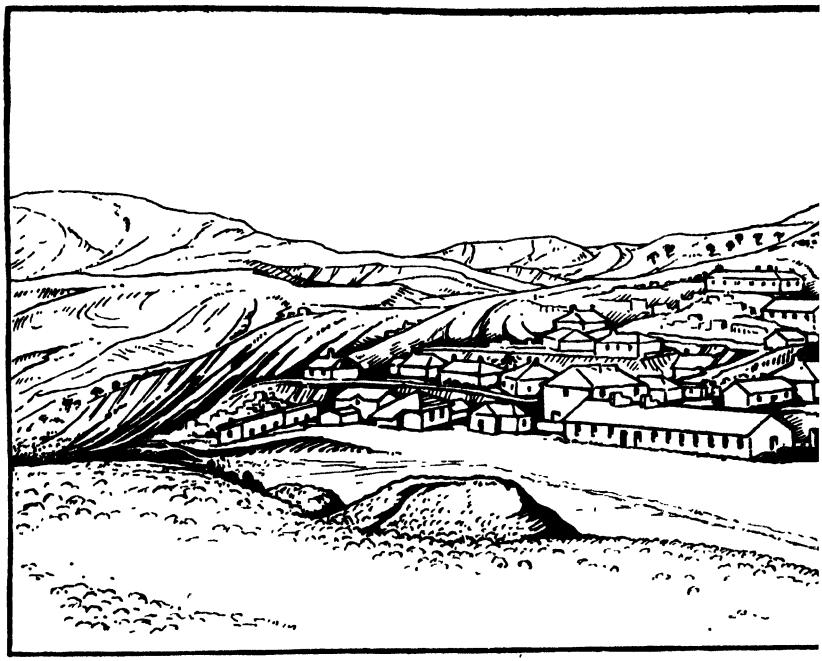


FIG. 24. *Güleman. General view of the*

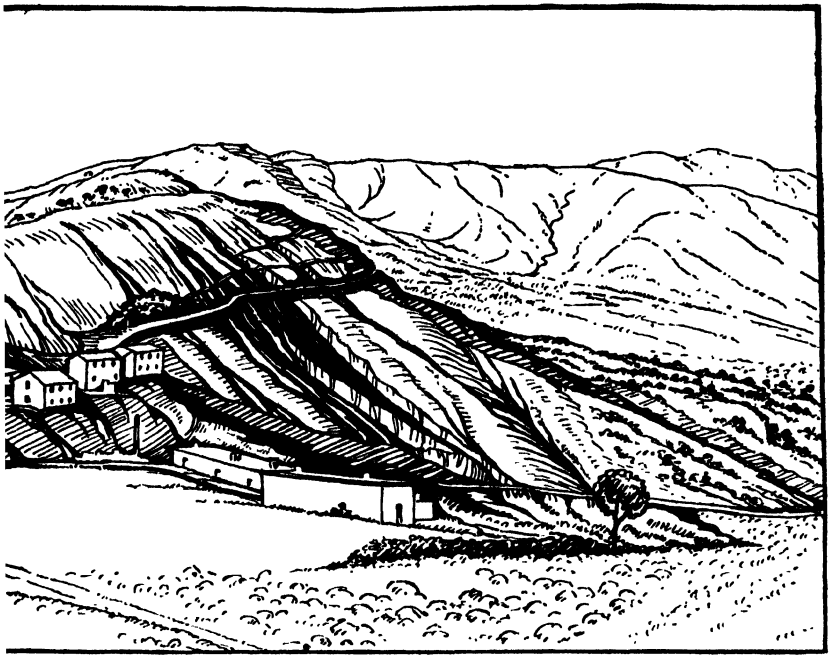
body is divided into three packets which are rather irregular in shape, and no estimate of reserves has yet been made.

3. At Torbali, in Izmir vilâyet.
4. At Çağlayik, in the Anamur region.
5. In the Berit Dağ, near Elbistan.
6. At Faraşa, near Kayseri.

Chrome

Turkey has exploited this ore since 1848 and was leading world-producer until 1895. She subsequently lost this position but, under the Republic, became second only to Russia. In 1938, with an output

of over 200,000 tons, she contributed about a quarter of the world's total production. Since that year production has declined considerably, owing partly to the approaching exhaustion of some of the largest mines and partly to serious shortage of equipment. The French company at Fethiye has also suffered recently from heavy flooding in their richest mine. But with improved equipment and transport it is thought that output could be increased, since reserves are still great.



mining settlement from the South

The deposits, totalling about 120, are in hilly country, usually in a series of pipe-like occurrences among the masses of serpentine which are so frequently exposed in Turkey. If near the surface, the ore is mined in quarries, or if deep-seated, it is approached by hillside adits, shafts being rare. The chief localities are near Bursa, Orhaneli, Tavşanli, Kütahya, and Eskişehir in the north-west; Aydin, Denizli, Muğla, Marmaris, Fethiye, Burdur, Antalya, and Mersin in the south-west and south; and Güleman, 12 miles east of Erganimadeni station, in the east. Among these the Güleman, Fethiye, and Eskişehir groups of mines are the most important, contributing respectively about 56, 24, and 19 per cent. In August 1942 it was

reported that a new chrome deposit had been discovered near Belen (? Beilan) in the Hatay, and others near Osmaniye (Seyhan vil.).

Güleman. These mines, among the largest chrome mines in the world, cover more than 4 square miles and include about 18 outcrops. The mine headquarters are on the saddle of a north–south ridge ending in Güleman hill (fig. 24), 12 miles by a mountainous but motorable road to Erganimadeni railway station and thence nearly 400 miles by rail to Mersin, the port of export. Mining began about 1935, when reserves were assessed in a conservative estimate at over 2 million tons, of which 200,000 were visible at the surface as bold outcrops among serpentine and limestone. The deposits, composed of veins and lenses, extend some distance along a north-west to south-east strike and are not yet fully assessed. The mineral content varies between 30 and 50 per cent., 40 per cent. being the minimum figure accepted by the United Kingdom Commercial Corporation. In 1942 it was said that the high-grade ores were nearly exhausted, but in view of total production figures since 1935, of which Güleman has contributed only a part, there must still be large reserves of medium- or low-grade ores. The mine is well managed and is linked to the ore-dumps at Erganimadeni by a two-cable aerial rope-way 12 miles long, with a capacity of 20 tons and a flight-time of 1 hour 48 minutes. The railway to Mersin can only take 3,000–4,000 tons of ore a day (1942). Further expenditure on transport and equipment is considered necessary; a washing-plant to be installed after the war should increase production. The mine is generally closed during January and February owing to severe weather. Besides stocks of ore at the head of the rope-way and storage bins at Erganimadeni, there is a stockyard taking up to 12,000 tons near the shipping wharf at Mersin (fig. 22).

Bursa–Kütahya–Eskişehir Region. There are about ten chrome mines in this region, the chief of which are shown in the list below; the area and output of some are not available.

Mine	*District*	*Area (acres)*	*Output (tons)*
Işikler	Bursa	2,350	26,640 (1940)
Kozluca	,,	620	..
Çatak	,,	..	200 (1939)
Küpeler	Balikesir	..	130 ,,
Eğrigöz	Tavşanli	..	200 ,,
Karliyer	Kütahya	490	..
Dağardi	,,	..	8,630 (1940)
Kavak	Eskişehir	470	2,600 (1939)
Başören	,,	..	1,770 ,,
Taştepe	,,	..	200 ,,



36. *Divrik. Magnetite deposit*



37. *Erganimadeni. Stripping the overburden, 1938*



38. *Silver-lead mine at Denek*



39. *Mining Village, Madenköy, Ala Hoca valley, Bulgar Dağ*

Production in 1942 in this region was estimated at only 20,000 tons. The Dağardi mine, one of the largest, was to cease production at the end of 1942 and the Kavak mine was to cease delivery of lump ore. The Dağardi mine is worked through a shaft 330 feet deep and is connected by an aerial rope-way to the Kütahya–Bandirma railway at Değirmisaz. Throughout most of this region transport is by lorry, and is restricted in autumn by the requirements of the beet crops. Production and transport almost cease in winter with bad weather.

Fethiye Region. Area and production of the chief chrome mines in this region are as follows:

	Mine	District	Area (acres)	Output (tons) 1939	1940
French-owned	Cenger	Fethiye	2,370	17,110	6,640
	Kargifoça	,,	430	8,930	8,590
	Kemikilikizlar	,,	2,460	4,200	..
	Üzümlü	,,	1,180	2,520	1,310
	Demirkazik	,,	2,240	4,370	19,100
	Gümlükbaşi	,,	1,200	..	..
	Domuzalani	,,	560	..	..
	Kargikak	,,	..	160	..
	Bülüşlü	,,	..	860	..
	Sandalbaşi	,,	..	3,410	..
	Siradere	,,	..	4,350	..
	Bezkeze	Muğla	..	2,320	..
	Kazandere	,,	..	..	..
	Atbükü	Antalya	..	300	2,430

Total production in this region in 1942 was estimated at about 26,000 tons, the decrease being due to poor organization and equipment, and to flooding. A narrow-gauge railway from the Fethiye district to the sea has been reported, but no details are known, and it is uncertain whether the report is correct.

Copper

There is a small production of copper in Turkey at the present time; although the future does not appear hopeful, energetic prospecting may result in the known reserves being increased. The mines are in two regions, one in the south-east at Erganimadeni, on the headwaters of the Tigris, and the other in the north-eastern corner of the country, within a short distance of Russia. They are all old mines which have been re-opened without that thorough examination which should have preceded their re-equipment, if economics rather than 'high policy' had been the main consideration.

The Ergani copper-mine is on the left bank of the Tigris, on the railway between Malatya and Diyarbekir. It has long been worked,

though handicapped by inaccessibility until the railway was opened in 1935. Between 1892 and 1913 about 1,000 tons of 'black copper' were produced annually and shipped to Europe. The Germans investigated it between 1914 and 1918 and established the presence of a considerable tonnage of sulphide ore; in 1923 therefore, the Ergani Company was formed with a 50 per cent. German interest. In 1935 the Eti Bank bought the mine, which since 1936 has been lavishly equipped with German-built machinery and the necessary power units and workshops (capacity 300 tons of ore a day). It is

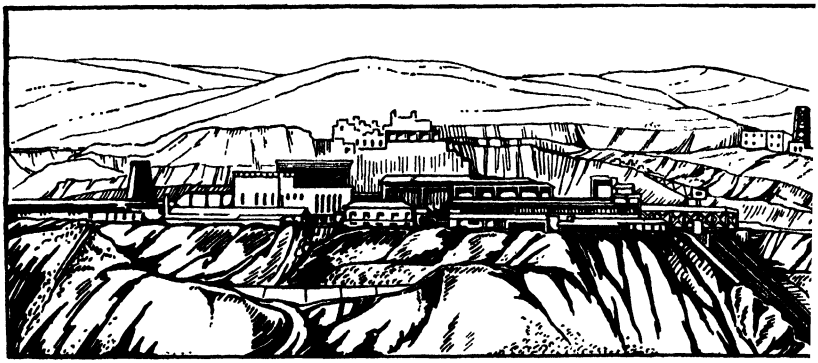


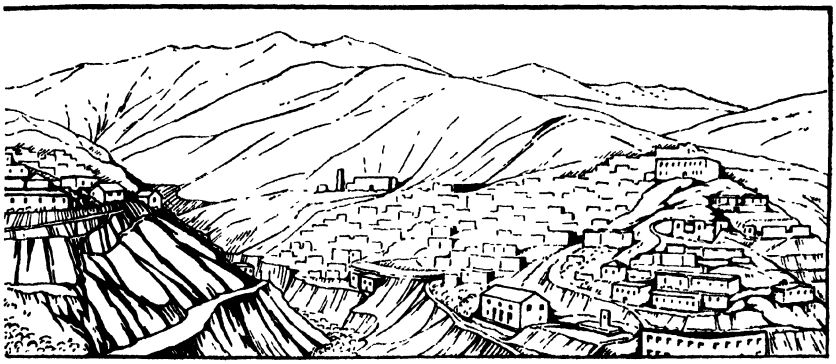
FIG. 25. *Erganimadeni copper-mines. Old town*

said to have produced 5,920 tons of copper ingots in 1939, much of it for the Kirikkale arsenal; and it may have an output capacity of 8,000 tons of metal a year; it is normally shipped from Mersin, about 400 miles away. In 1941 it was reported that a German copper-foundry was being sent to Turkey and that an electrolytic refining plant is planned (fig. 25).

The ore body is ellipsoidal, 650 feet long from east to west, 425 feet from north to south, and about 90–120 feet deep. There is an overburden of from 60 to 90 feet, mostly diabase and limestone, which is removed by hand and mechanical shovel. The main ore is a body of chalcopyrite, the weathered pockets of which are followed erratically by the old workings. The mining is simple, known as open-cast working, and little more than quarrying. From data provided by diamond-drilling, reserves are calculated at 3 million tons of ore with 10 per cent. or more copper, and should give a life to the present mine of 10 to 15 years from 1939, when production was due to begin. Marginal extensions of the deposit are probable, particularly on the north-west. The mine is a high-grade copper proposition, but its

economic future is handicapped by heavy overhead charges and lack of skilled labour.

Kuvarşan copper mine lies north-east of the road from Artvin to Hopa, about 18 miles from Artvin and nearly 30 miles south-east of Murgul. It can be reached by a steep mountain track 27 miles long, motorable in good weather, and by an aerial rope-way 1¼ miles long. Formerly in Russian Georgia, the mine used to be worked by German interests, but the Turkish Government took it over and have since carried it on with difficulty. Reserves of under 200,000



and new Government buildings on right

tons (4–5 per cent. copper) were estimated from the residue left in two irregular lenses of chalcopyrite lying between beds of limestone and quartzite. The mine is reported to be in dangerous condition, and in 1938 a daily output of 100 tons was barely maintained. Even at this low rate the life of the mine as at present known is limited to about 5 years or less from 1939. The plant is German but in bad repair. Exports go through Hopa, but facilities are poor.

Murgul copper mine is on the left bank of the Adurça stream, south-west of Borçka (Yeniyol) and about 33 miles by a motorable road from Hopa, the same small port which serves Kuvarşan. Slag-heaps point to early working, but its modern history starts in 1898, when a smelter was erected and the Caucasus Copper Company formed. It failed 4 years later, but a concentrator was then installed, and between 1907 and 1914 nearly 15,000 tons of copper were extracted from about 750,000 tons of ore, the richest which the mine contained. It was neglected until 1935, when fresh examination of the veins in a silicified andesite led to plans for reconstruction and repair. So far as is known, production has not yet begun (1942).

Reserves appear to be about 4 million tons of ore, averaging about 2·75 per cent. copper in two bodies at Cangara and Sosveni. Modern plant is being installed to effect concentration by flotation methods. This is designed ultimately to treat 10,000–12,000 tons of ore annually. The life of the mine as at present known is about 7 years. Local labour problems and the severe winter of this region are likely to hinder exploitation. An aerial rope-way 1½ miles long, and a steep, tortuous mountain track 5½ miles long and fit only for light traffic, link the mine to the concentrator and smelting plants below the confluence of the Adurça and the Murgul Çay (tributary of the Çoruh river). Exports will go through Hopa.

In addition to the above deposits, copper ore has been located near Ordu, north and south of Izmir, and in the Hatay north of the Syrian border; but the outlook for production in Turkey is not bright, and with the high overhead costs due to lavish equipment, copper can be exploited satisfactorily only during abnormal times when the need is great and the price is high.

Lead and Zinc

These two metals occur together (mainly as galena and zinc-blende, in limestone formations) and are usually accompanied by a little gold and silver. As some deposits had a surface-oxidized zone which attracted attention and was easily worked, they have been worked since ancient times in widely scattered localities, but generally only on a small scale, the deposits being rich but irregular. Most of the old mines are now abandoned but may have vestiges of ore left to trap the unwary and cause an expenditure of time and money not ultimately justified. The chief mines occur at Balyamadeni, half a mile south of Balya (Balikesir vilâyet); near Anamur; in the Bulgar Dağ of the main Taurus; at Keban (Gümüşmadeni), near the junction of the Murat with the Euphrates river; and at a few places in the northern mountains, such as Gümüşane, Gümüşhaciköy west of Merzifon, and Çamdağ north-east of Adapazari.

The mines at Balyamadeni have been worked since early times, chiefly in the zone of surface enrichment which is now worked out. Galena occurs in veins below, but these are so costly to operate that the mine was closed in 1940. There has been a considerable output of zinc-blende, galena, and arsenic in the past—14,000 tons of lead being reduced in 1913—but since 1919 barely 9,000 tons have been won in the best year. There is a smelter with an annual capacity of

12,000 tons of pig-lead; and exports formerly went by a narrow-gauge railway to Ilica, a small port in the Gulf of Edremit.

The Ortakomuş mine near Anamur, which had a productive capacity of 7,000 tons a year, has also closed down. Plant includes a concentrator, water-jacket furnace, and a smelter with an annual capacity of 3,000 tons of soft lead.

On the northern slopes of the Bulgar Dağ, a high range in the main Taurus, lie the lead and zinc deposits of Bulgarmadeni, between 5,500 and 7,500 feet above sea-level but reached by a good track, 14 miles long, from Çiftehan station on the Konya–Adana railway (photo. 39). A steep mountain track connects the village with the workings, but is subject to avalanches in winter and spring, and sometimes impassable in winter. There are veins in an east–west belt a mile long, the ore occurring in caverns, both among alluvial clay, sand, and pebbles and on the walls and floors, in a shatter-zone of limestone and schist. Other deposits occur over a distance of 4–5 miles northwards. Reserves were estimated in 1938 at 300,000 tons, but much of this material was probably alluvial. The ore contains between 5 and 7 per cent. of lead, 4·7 per cent. of zinc, and small quantities of silver and gold. Profitable exploitation of the mine is considered possible only if the gold is properly extracted. The plant now installed for lead and zinc extraction seems to be too costly for the known prospects. The engine-room, workshops, and living quarters are at the mouth of the compressor tunnel. Timber for the mine has to be brought from Pozanti at high cost, and when no snow is lying, water must be brought up from the valley.

Kebanmadeni was also worked long ago. It is near the Euphrates about 30 miles north-west of Elâziz, and was re-examined in 1934. The old workings are concentrated in a belt about half a mile long, following the north–south axis of the deposit. The ore body, accompanying dikes of porphyry in a shale and sandstone series, has a high metal content—lead 12·9 per cent. and zinc 16 per cent.—but reserves estimated at only 35,000 tons seem barely sufficient to justify expenditure on new equipment. The ore consists of zinc-blende, pyrites, and galena, partly altered by oxidization. The old miners extracted only this oxidized part, which was easy to smelt, leaving the sulphide zone almost untouched. The remaining deposits are therefore rich and might be profitably worked, although in 1938 an expert said that marketable lead could not be produced in economic quantities for at least 3 years. The mine was expected to be in full production before the end of 1942, and a smelter, to be built at Mersin or

Iskenderon, was to be ready by the end of 1943. This plant was to be installed by Germany. Transport would be either by road to Elâziz—an old route which has been repaired—or, more probably, by boat down the Euphrates to Firat station on the main railway, a journey shorter by 116 miles.

Lead-zinc ore is also found at Çamdağ on the banks of the Kara Su, east of the Sakarya in a zone about 6 miles long. The reserves may be large, but are unmeasured, and at present it is only a prospect. Another field which may repay thorough examination is the State-owned Denek mine at Keskin, between Kayseri and Ankara. This formerly belonged to a French company, who abandoned the mine after extracting the rich silver-lead ore and after failing to trace any extension at the bottom level of 210 feet (photo. 38).

Production of lead and zinc (in tons) has been as follows:

	1936	*1937*	*1938*	*1939*
Lead ore (metal content) . .	4,700	4,800	4,900	6,400
Primary lead	300	600	900	400*
Zinc ore (metal content) . .	9,600	10,000	9,600	7,500

* Provisional figure.

Silver

About 6,000 tons of argentiferous lead were produced annually in Turkey between 1926 and 1936, mainly from mines at Gümüşane, but these have been closed for some time. Silver is also found in the lead mines of Keban, at about 2,450 feet, and plans for its exploitation are reported. The mine was worked a century ago but closed when the price of silver fell, and its reopening was only considered when the Diyarbekir–Fevzipaşa railway improved trade prospects. Silver production in fine ounces: 1936, 300,000; 1937, 380,000; 1938, 350,000; 1939, 575,000.

Gold

Before 1914 Turkey produced between 6 and 13 tons of gold annually, the chief mines being at Bulgarmadeni in the Taurus and at Balya in Balikesir vilâyet. There is no specific gold-mining now and, although the copper and lead-zinc deposits carry small quantities of gold, none is obtained from these ores since the copper is exported in blister form, which allows of no recovery of gold, and production from lead-zinc ores seems to have ceased. The most promising source of any future gold-mining is at Bulgarmadeni, where it is said that gold accounts for about 75 per cent. of the value of the lead-zinc

ore (p. 123; photo. 39). In 1938, 514 fine ounces were produced in the whole country.

Sulphur

There are about fifteen known sulphur deposits in Turkey, including those near Çanakkale, Izmir, Denizli, Keçiborlu, Ergani, and Bayburt. Exploitation of the Ergani deposit is reported to have begun, but up to 1942 the only important and developed mine was at Keçiborlu on the Dinar–Eğridir railway, where sulphur impregnates the bituminous clay. Reserves here were estimated at 1 or 1½ million tons, with a sulphur content of 20–40 per cent. Output of native sulphur rose from 12 tons in 1928 to nearly 3,900 tons in 1938, but fell to 2,010 tons in 1940, i.e. about 3,000–4,000 tons short of Turkey's normal requirements, which include 3,500 tons for insecticides and fertilizers and 1,500 tons for explosives. The plant installed at Keçiborlu in 1935 and now owned by the Eti Bank has a capacity of 5,000 tons, but present production (1942) is considerably lower.

Manganese

Manganese occurs as pyrolusite (oxide) in several localities—near Trabzon, Ereğli, Bolu, Bursa, Biğa, Izmir, Fethiye, Antalya, Afyonkarahisar, and Eskişehir. The most important deposit so far is that at Üzümlü, about 12 miles north-north-east of Fethiye, where a bed of limestone about 3 feet thick, containing at least 40 per cent. manganese, is exposed. Its outcrops, lying between red sandstones, with serpentine and chromite above, and shales, limestone, and oolitic ironstone below, can be followed for 15 miles. The deposit has been worked for many years and a German company is said to have spent £T.500,000 on equipment. A funicular of 500 tons capacity is reported to carry the ore to Fethiye for export. Production, which was once 15,000–20,000 tons of ore a year, recently fell to 3,300 tons, but it is thought that it could be raised to 45,000 tons annually without great trouble.

Three other productive mines are near Afyonkarahisar and Eskişehir, the latter yielding about 800 tons in recent years. The Kepez mines, about 4 miles from Ereğli and connected to the port by funicular, are said to be closed down, but in July 1942 a German mining paper reported the export of 5,000 tons of manganese from Ereğli to Germany. In September 1942 the Karabük steel works were said to be seriously short of manganese.

It is said that high-grade deposits have been found in the Biğa district (Çanakkale vilâyet) and at Sunla on the Black Sea coast, and that Germany is interested in exploitation, but no details are yet known. A further considerable find was reported in August 1942 at Cebeciköy in the Kemerburgaz district of Istanbul vilâyet.

Production figures of ore are shown below:

1934	13 tons	1937	530 tons
1935	9,200 ,,	1938	2,186 ,,
1936	4,600 ,,	1939	3,339 ,,

Emery

Until recently western Turkey and the Greek island of Naxos shared the world monopoly of this important abrasive. The deposits occur in the vilâyets of Izmir, Aydin, and Muğla, the best quality coming from near Nazilli. There are many workings between Tire and Söke, on both sides of the Izmir–Aydin railway, and in the newest field stretching almost continuously from the mouth of the Büyük Menderes to Muğla. There are also old workings south of the Menderes and in the Banaz valley. The chief mines are shown below:

Location of mines	*Place near*	*Probable capacity (in tons p.a.)*
Seyköy (2 mines)	Milas	4,500
Kizilmeşe	Milas	2,500
Eskihisar	..	
Kemerkaya	Söke	
Kayabaşi	Milas	2,200
Almanboğazi	Izmir	
Kozağaç	Milas	
Nebiköy	Milas	1,800
Yeniköy	Tire	
Meskenköy	Milas	
Serefeğridağ	..	1,000
Elmacik	..	

The first two groups are Turkish-owned, the last three British.

The deposits are mainly superficial, mined from open pits with occasional shafts. The ore (aluminium oxide or corundum) occurs in numerous lenticular masses, each lump being up to 6 inches in diameter, free from magnetite, and embedded in red-brown clay in a marble formation overlying schists of the Aydin block. In the north the mineral is carried by aerial rope-way to the Izmir–Aydin

railway, usually to Çamlik station. In the southern or Muğla district it is taken by lorry to Küllük.

Production was once about 40,000 tons a year, but has now fallen owing to low prices, the development of artificial abrasives, and the war of 1939. Exports show a corresponding decrease. Recent figures are as follows:

	Production	*Exports*
1938 . .	8,452 tons	8,370 tons
1939 . .	9,978 ,,	9,550 ,,
1940 . .	9,113 ,,	8,393 ,,
1941 . .	..	911 ,, (6 months)

Antimony

About fifteen deposits of antimony are reported to have been found. The richest and, so far, the only exploited mine is a few miles north of Turhal, in Tokat vilâyet, on the north-west slopes of a short range of hills ending near the railway to Samsun. The stibnite veins run for about 3 miles in a north–south direction, with cross veins striking east-south-east, cutting a group of limestones, schists, and diabase. The main ore bodies are white quartz bands up to about 3 feet thick, but often split into several parts by graphite schists. Reserves are estimated at 40,000 tons of 8–10 per cent. stibnite, but further prospecting at depth may reveal more. The ore is hand-sorted into two grades, the richer containing 50 per cent. stibnite, the poorer 20–30 per cent.; lump shipping-ore is said to be 54 per cent. stibnite. Annual production increased from 200 tons in 1935 to nearly 1,200 tons in 1939 and in 1940. The ore is shipped through Samsun.

There is said to be a good, but disused, mine at Çinlikaya, and another near Ödemiş, where 2 veins extend 1¼ miles and formerly yielded 1,000 tons a year. There are also small mines near Samsun, and one vein about 3–4 feet thick near Kütahya; but, in all these, excessive arsenic spoils the quality of the antimony.

Molybdenum

Molybdenite, the sulphide, is found at Hüseyinbey Ovasi, on the southern slopes of a low chain of hills at 3,450 feet near Keskin and about 6 miles south of the Ankara–Kayseri railway. Quartz veins carrying about 2½ per cent. molybdenite, associated with magnetite, pyrites, chalcopyrite, and galena, accompany pegmatite veins which cut a granite mass. One main vein and two easterly veins, trending roughly north-east to south-west, stretch considerable distances, but

mineralization is sporadic, difficult to prospect, and offers no sound basis for mining schemes. Plant to treat 25 tons of ore daily was installed by Krupps, using power from a small thermal station at the mine and water for flotation from a dam on a mountain stream; but the mine is reported to have been worked out and the plant dismantled.

In 1937 deposits were reported on the southern slopes of Ulu Dağ (near Bursa) and on Dikmen Dağ near Çan (Çanakkale vilâyet). More recently, deposits have been reported near Inegöl, Bursa, Biğa (two), and Kellemiç, but no details are available and exploitation is unlikely at present.

Production of ore was 43 tons (metal content 26 tons) in 1937, 80 tons (metal content 41 tons) in 1938; in the latter year exports (including reserve stocks) were 103 tons, but none are recorded since then.

Mercury

Cinnabar, the sulphide, is found at a number of localities in western Anatolia, near Inebolu, Bursa, Manisa, Izmir, Ödemiş, Aydin, and Sizma north of Konya, but it is only exploited in two regions. The first is the Karaburun peninsula (Izmir vilâyet), where mines at Ahirli and Karareis are worked by open-cast methods and about 100–125 workmen are employed. The second district is Uşak, where the Balatli mine is expected to produce 100 flasks a month.[1] Production and exports have been as follows:

	Output (metal)	*Exports*
1938	597 flasks (20·6 tons)	18 tons
1939	395 ,, (13·6 ,,)	11 ,,
1940	500 ,, (17·0 ,,)	9 ,,
1941	300 ,, (10·3 ,,) (estimate)	2 ,,

Salt

Rock salt is found in eastern Anatolia, chiefly in the same group of Tertiary beds which yield lignite. Elsewhere, especially in central Anatolia, the salt emerges in springs feeding salt-pans, which are worked in summer in many places, e.g. at Koçhisar near Tuz Göl, Karapinar, and Palas near Tuzla Göl, 29 miles north-east of Kayseri. Sea salt is obtained from Çamalti, 15 miles north-west of Izmir, Tuzla in the Seyhan delta, and elsewhere. Output averaged 250,000 tons a year between 1937 and 1939. In 1935 about half the output (125,000 tons) was exported, but recent figures are lacking.

[1] 1 metric ton = 29·008 flasks of 76 lb.

Boracite

After the U.S.A. and Chile, Turkey is the third largest producer of boracite in the world; her only mines are at Sultançayir, about 4 miles south of Susiğirlik and 40 miles south of Bandirma, the port of export, after which the mineral, a hydrated calcium borate, is known locally as 'Pandermite'. The deposit is trough-shaped and the knolls of snow-white, fine, crystalline material, irregularly interbedded with layers of massive gypsum, are worked at several points along the outcrop. The mine is owned by a branch of Borax Consolidated, Ltd. Output varies enormously, between 4,000 tons for the whole of 1938 and 2,500 tons for the month of August 1939, when an eager German market stimulated production. Output in 1939 was said to be 15,200 tons. At present (1942) production is practically at a standstill.

Magnesite

There are small veins of magnesite in serpentine near Çanakkale, Manisa, Aydin, Kütahya, Eskişehir, and Mihaliççik, exploited in 1937 by private companies. Production began in 1929 and increased to 1,062 tons by 1935; subsequently it fluctuated between 600 and 850 tons, but a German mining report of 1941 said that production in 1941 reached 1,900 tons (possibly of ore) in the Mihaliççik area.

Asbestos

Asbestos of moderate quality was discovered in Kars vilâyet in 1934, and production on a small scale is also reported from the village of Tatarcik near the Ankara–Eskişehir railway. In December 1941 a report from Ankara said that total production of raw asbestos is only 100–150 tons a year, and that the mineral has short-staple fibre and up to 60 per cent. foreign matter.

Arsenic

Arsenic occurs in about eighteen districts, notably in the Izmir hinterland—at Elbaşi near Dinar, at Tire, and at Sart near Turgutlu, and also near Balya (Balikesir vilâyet). Production reached 55,000 tons in 1930, but has recently fallen to less than 50 tons owing to low prices. The average mineral content is said to be about 40 per cent.

Meerschaum

Most of the world supply of meerschaum, a hydrated magnesium

silicate like serpentine but containing more silica, is found in Turkey, mainly near Tutluca in the Eskişehir district, where five large mines cover an area of 2,140 acres. It is absorbent, easily carved, and used for pipes, insulators, and ornaments, but it is now in very small demand and production was only 317 cases in 1939 and 440 cases in 1940.

Marble

A small amount of marble is quarried in western Turkey, especially in Marmara Island ('Marble Island'), and near Tarsus. The output was 4,700 cubic feet in 1938 and 6,000 cubic feet in 1939.

Miscellaneous

Alum is mined near Şebinkarahisar and exported from Giresun and other ports for use in the paper industry at Izmit.

Fuller's earth is found over an area of about 150 square miles near the upper Sakarya to the west of Ankara. Production was 5,845 tons in 1938, and 7,220 tons in 1939.

Glass-sand of good quality is found at Çatalca, west of Istanbul, and is used in the glass works at Paşabağçe on the Bosporus (p. 219).

Kaolin, or china clay, is obtained in several localities, but the best comes from Kütahya, where there has long been a pottery industry, and also from near Silifke.

Opal. There is a siliceous rhyolite at Karamancik, south-east of Simav, in which thin veins containing opal occur. A very small industry deals with it.

CHAPTER XIV

AGRICULTURE, IRRIGATION, FORESTRY, STOCK-RAISING, AND FISHING

AGRICULTURE has always been the principal occupation in Turkey, for the plateaux and mountains afford almost unlimited grazing, while the valleys and plains with their fertile soil and hot summers are ideal for grain, fruit, and such industrial crops as cotton, tobacco, and opium. Under the Ottoman Empire, however, the country's natural resources were badly neglected. Taxes on both land and produce were excessive, corruption and debt frequent; farming was primitive, and there was ignorance, superstition, and conservatism; land was rarely fertilized; blight and insect pests ravaged unchecked, and irrigation, transport, and marketing facilities were inadequate.

Forestry was altogether neglected; inroads by wood-cutters (especially during 1914–18), and by charcoal-burners and peasants everywhere, were serious; no replanting was organized, and goats ruined all exposed young trees, leaving only scrub where forests once grew.

Stock-raising was equally ill organized; there was no scientific breeding, and disease was prevalent. Many pastoralists were tent-dwelling nomads with habits of lawlessness. Kurdish tribes in particular were notorious, and villages on their seasonal routes suffered severely. Religious, political, and personal feuds sometimes led to crop destruction, more often to cattle-lifting and sheep-stealing, and always the nomads did great damage to trees through fires and reckless cutting.

About four-fifths of the population still depend on the land for a living, while it supplies about one-third of the national income, and another third comes from the handling of agricultural products. The Republic therefore, appreciating the fundamental position of agriculture in Turkish life, has begun far-reaching reforms through systematic State control, financial support, and scientific methods, some of which are described later in this chapter, and in the next.

It has been said that, in an emergency, Turkey could be self-supporting in all foodstuffs except coffee, and also in wool, cotton, timber, leather, and tobacco, and that she would have a small surplus

in most of these products. Normally, she imports about 5,000 tons of coffee a year and 65,000 tons of other foodstuffs.

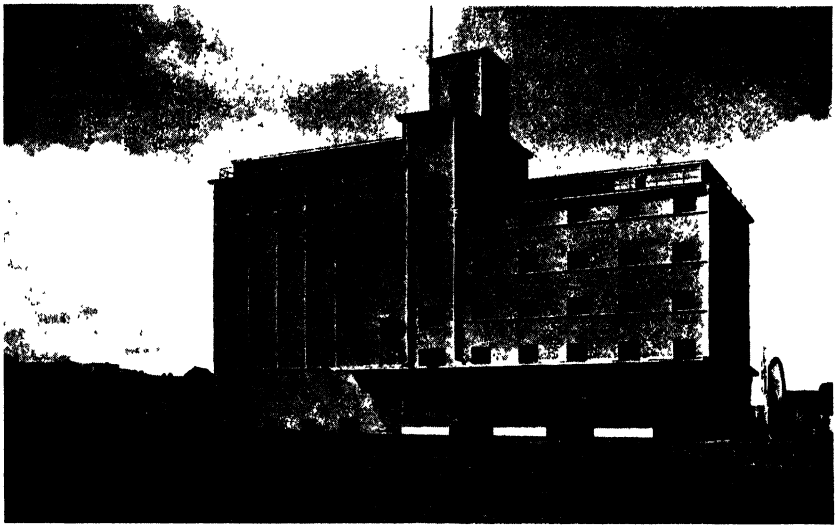
Soils. The richest soils are in the alluvial plains near the coast, in the wide valleys, and in volcanic regions (e.g. Afyonkarahisar, Kayseri, and Lake Van); the most infertile regions are among the granite, crystalline, and limestone hills, near the salt marshes surrounding many of the inland lakes, and in the semi-deserts of the central plateau and south-east frontier; in addition, some areas, especially on the plateau, have coarse shallow soils, mainly because the heat and rain, coming in different seasons, cause little weathering, and the sudden heavy showers of spring and autumn cause violent soil-erosion where there is already no protecting vegetation. To increase productivity, therefore, irrigation and fertilizers are necessary during summer drought, while drainage and protection works are equally important in some places in winter (pp. 152–65).

Besides the new and projected large Government works, local irrigation is frequent, from rivers, streams, springs, and wells. Aqueducts and channels are used, with primitive bucket-and-pole appliances, and Persian wheels (e.g. on the Porsuk Çay below Kütahya). On parts of the plateau, deep narrow gorges make irrigation difficult, but it is common in the depressed troughs or 'ovas' (e.g. near Çankiri, Sivas, and Gümüşane). Among the Taurus and Kurdish mountains tiny irrigated fields are common, dependent on melting snow in early summer.

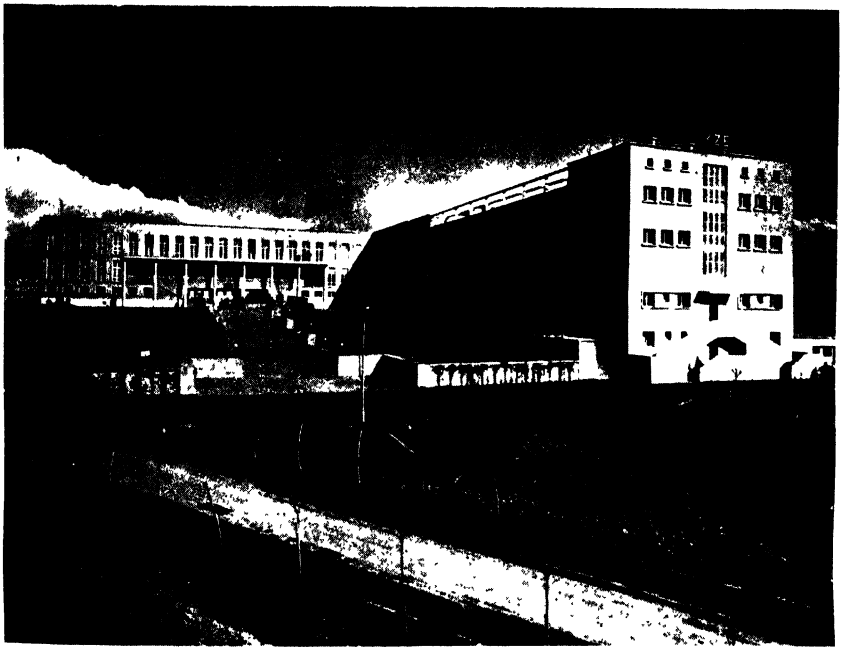
Fertilizers. Owing to the habit of seasonal migration and to the lack of co-operation between pastoralist and cultivator, manuring is rare, apart from sheep-tread in spring and autumn. Chemical fertilizers are being introduced (e.g. lime and phosphate in sugar-beet cultivation, and in the Adana plain) but progress is very slow and fallow land is common. Potash deposits are said to exist, but have not been developed. A rough system of crop rotation frequently consists of wheat (1–2 years), oats, and fallow, perhaps followed by wheat and sesame; near Adana, cotton is followed by cereals; near Izmir, legumes by wheat.

Research Stations have been set up near large towns like Ankara,[1] Eskişehir, Adapazari, Istanbul, and Adana, to experiment with seed, breeding, disease, crop rotation, fertilizers, &c. These have had some successful results, but it is difficult to spread the new knowledge. Instructors are still too few, and the peasants often illiterate or

[1] Produce from the Model Farm (*Gazi Çiftlik*, p. 32), a gift of Atatürk and open to the public, is sold regularly in the town, and is very popular.



40. *Grain Elevator at Ankara*



41. *Institute for Higher Studies in Agriculture, Ankara*

conservative. Time is also required to give convincing demonstrations. There were twenty State nurseries in 1941 for the distribution of over 20,000 metric tons of tested seed.[1]

Instruction is given, however, through the Central Agricultural Institute and twenty-two others which study special subjects (photo. 41). There are also schools for mechanized farming, sericulture, and four for cultivators (Istanbul, Bursa, Izmir, and Adana), besides local courses and practical demonstrations.

Taxes. For centuries the Turkish peasant has been over-burdened with taxes and a tithe of his products, which unscrupulous tax-farmers increased at will. This tithe was removed in 1925 and many other taxes lightened, but the farmer's lot is still hard and many are constantly in debt. A tax of 10 per cent. is levied on most produce.

Co-operative Societies, Loans, and Subsidies. Co-operative societies have been formed by the State to lend money on easy terms. In 1939 there were 660 credit societies, backed by the Agricultural Bank (p. 181), a State concern which has used its resources for granting credits and subsidies and for promoting irrigation. Between 1932 and 1940 membership of the co-operative societies rose from about 52,700 to 141,600. By 1941 they served 4,437 villages, spreading agricultural knowledge, providing selected seed and stock, and buying produce. Prices are stabilized by restricted imports and by subsidies; guaranteed purchase of wheat, sugar-beet, cotton, opium, tobacco,[2] and other products at a fair price has been accompanied by relief from tax on land for sugar-beet production, by a bonus granted to large-scale growers of wine-grapes, and by reduced transport charges for certain agricultural products (e.g. sugar-beet, raisins, and all produce in eastern Turkey).

For the history of Turkish land, and for recent land policy, see Vol. I, Chap. IX.

Agricultural Machinery and Methods are still primitive. The only large-scale use of modern machinery (mainly American) is in the Adana plain, especially on the cotton plantations.[3] There are some combine-harvesters, threshers, and winnowers on big wheat-farms, and American steel ploughs and tractors are slowly replacing the

[1] Metric tons are used throughout this chapter unless otherwise stated. Figures, though generally semi-official, should be accepted with reserve.

[2] A State 'Monopoly', under a General Administration of Monopolies, exists for the purchase and subsequent treatment of certain products—alcohol, tobacco, opium, and others.

[3] One cotton-grower recently estimated that with 2–3 shifts and electric head-lamps at night he used his tractor 280 twenty-four-hour days in the year.

simple old wooden ploughs drawn by oxen or buffaloes. In both 1940 and 1941 the State allotted £T3 millions for the purchase of modern machinery, some doubtless to be supplied by the Karabük steel-works. The total number of agricultural machines increased from 344,750 in 1933 to 638,025 in 1940.

In 1940 a plan to organize agriculture was started. The country was divided into four zones, each containing about 5,000 villages, each having about 50 tractors, and each to have its own threshers and reapers. The machines are let for a small fee to peasants. The improved ploughing coupled with autumn sowing should increase the grain output considerably. The collective groups, known as *kombinats*, are being fostered by the Ministry of Agriculture since the mobilization of man-power and the requisitioning of horses. They are also introducing grass-sowing, to improve stock-rearing.

The date of spring sowing (often done by hand and occasionally on the stubble before ploughing) varies, according to climate and crop, from March in the south and on other sheltered lowlands, to May in the north and on exposed hill-sides. About three-quarters of the peasants sow in autumn after instruction, as against a quarter before. Wheat, barley, rye, and oats are generally sown in October or November; land for commercial crops is usually ploughed twice in Western Anatolia and European Turkey. Harvesting begins in June in the south and west, July on the plateau, and August in the east, where snow may fall as late as May. Except where there is machinery, threshing is done by driving three or four ponies or oxen over the sheaves, dragging a heavy piece of wood, studded with spikes or sharp stones. Grain is usually winnowed by being thrown up into the wind in wooden shovels.

Factories and Storage. The State has built elevators for grain-storage (p. 137), and many factories, such as that for cotton at Kayseri, sugar at Uşak, meat at Trabzon, and milk-powder at Kars. Packing and shipping facilities are increasing, while inspection and grading are raising the standard of exports.

Cultivation

Although nearly one-third of Turkey is said to be potentially arable, it is doubtful whether more than one-twentieth of the land is actually planted.[1] Total production is said to have increased from

[1] Estimates by different authorities vary between 3 and 13 per cent. in different years. The higher figures may include some fallow-land or double crops. In the

5·7 million tons in 1928 to 10·5 million in 1941. The variety of soils and climate make a wide variety of crops possible, but a combination of summer and winter crops on the same ground is difficult because of drought and the lack of fertilizers, which make long fallow-intervals necessary. Food crops thrive in most of the plains and valleys and on small hill-side terraces; crops in the east are generally for subsistence; industrial crops grow mainly in the west, owing to relief, soil fertility, and export facilities.

Cereals (hububat)

Cereals have always been important in Turkey, but under the Republic the area under cereals is said to have been doubled and in

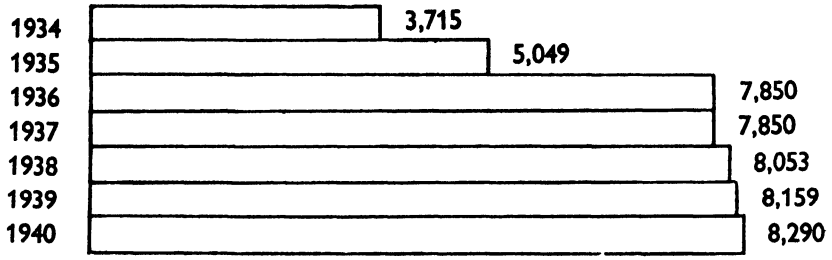


FIG. 26. *Cereal Production (thousands of tons)*

1940 to be four-fifths of the total cultivated; production for the years 1934–40 is shown in fig. 26.

Wheat (*buğday*). Wheat is the principal cereal, grown on all the plains of the north-west and south coasts and of the plateau. Specially productive centres (fig. 27)[1] are Amasya, Adapazari, Burdur, Adana, Niğde, and along the Eskişehir–Konya and Eskişehir–Ankara railways. Selected seed is now distributed through 168 centres. In 1938, 40,000 tons of local seed were selected, as against 21,000 tons in 1937. Harvest is from June to August according to the district: south coast in late June; Aegean coast in late July; plateau and inland valleys in August. Production is now about 4 million tons a year; the 1942 crop prospects were good. Imports worth £T19 millions in 1924

absence of detailed surveys, many such estimates must be very rough, and even 10 per cent. of the total area of the country would be very difficult to cultivate with the present working population.

[1] The diagrams showing the yield of various products only give a rough idea of distribution by vilâyets. They are compiled by dividing the yield per vilâyet by the approximate area, and take no account of local topography. All figures in this chapter, though semi-official, should be accepted with caution.

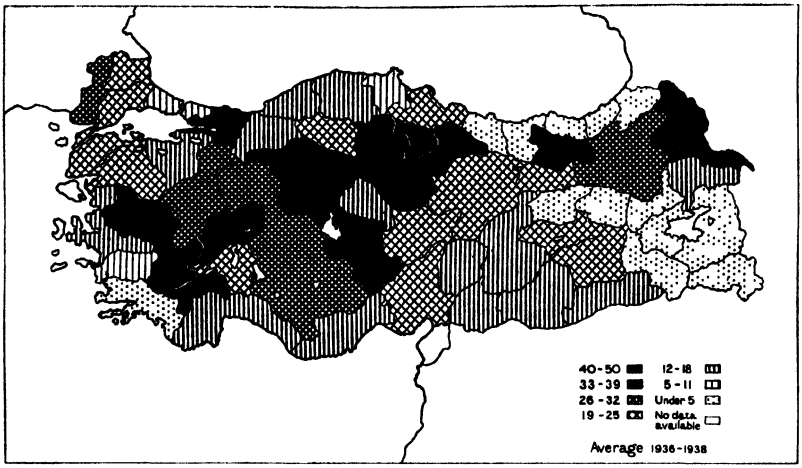


FIG. 27. *Wheat and Barley. Yield in tons per square mile*

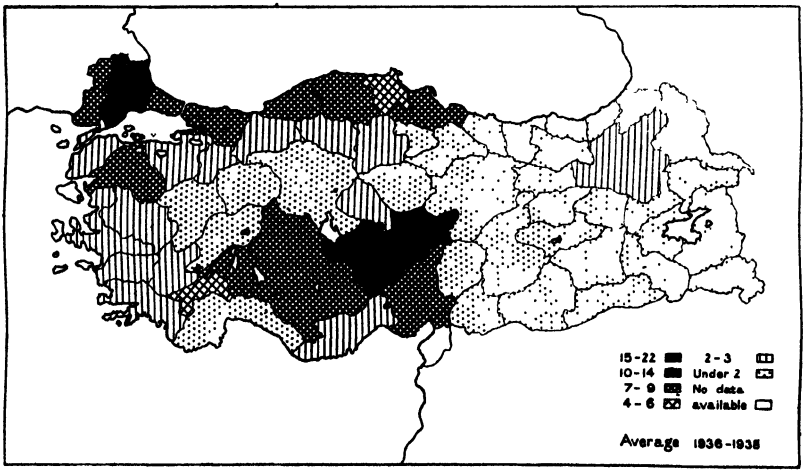


FIG. 28. *Rye, Oats, Spelt, Maslin, and Millet. Yield in tons per square mile*

fell to nil in 1930, since when there has been an increasing surplus for export (up to 100,000 tons), although export was banned in 1939 owing to the war. Shipments went mainly through Haydarpaşa, where there are quayside elevators, and Izmir. Fifteen State grain elevators have been built by the Agricultural Bank, two others at Haydarpaşa by the State railways, and more are planned which will bring the total capacity up to 100,000 tons. This scheme relieves farmers of storage problems and prevents waste, reserving good corn for next year's seed, for export, for home use during the year, and for emergencies. There was said to be a reserve of over 500,000 tons in January 1940, presumably distributed throughout the country, mostly among individual holders.

Completed elevators in 1939 included the following:

Site	*Capacity*	*Site*	*Capacity*
Haydarpaşa (1)	9,500 tons	Yerköy (1936)	3,000 tons
,, (2)	5,000 ,,	,, (1935)	1,000 ,,
Derince (1935)	10,000 ,,	Balikesir (1935)	1,000 ,,
Afyonkarahisar (1936)	5,000 ,,	Akşehir (1935)	1,000 ,,
Polatli (1936)	5,000 ,,	Denizli (1935)	1,000 ,,
Ankara (1935)	4,000 ,,	Çerikli (1935)	1,000 ,,
Konya (1935)	4,000 ,,	Haci Şefaatli (1935)	1,000 ,,
Eskişehir (1935)	4,000 ,,	Çiftlik (1937)	1,000 ,,
Sivas (1935)	4,000 ,,		

Total capacity: 60,500 tons.

Others are planned for Tekirdağ, Kütahya, Şarkişla, Zile, Belikhan, Niğde, Baladiz, Diyarbekir, and elsewhere, mostly on or near railways. There are numerous flour-mills (over 50 large ones), and several biscuit factories, but flour reserves are said to be small. (For the elevator at Ankara, *see* photo. 40, p. 132).

Barley (*arpa*) is the most important cereal after wheat. Some is for brewing (largely for export), the rest for fodder. The latter grows nearly everywhere, the former is best on the north-west coastlands and in the vilâyets of Manisa, Izmir, Aydin, Afyonkarahisar, Eskişehir, Ankara, and Kars (fig. 27). Production is over 2 million tons a year, of which roughly 5 per cent. is exported, mainly from Izmir, Istanbul, Haydarpaşa (through elevators), and Mersin. Beer, containing 2·25 per cent. alcohol, is produced under the Turkish Spirit Monopoly.

Rye (*çavdar*) is grown in most parts of Turkey, especially the dry hilly regions of Europe and the south of the plateau (fig. 28). About 450,000 tons are grown annually, a little for export. It is commoner than in most Mediterranean countries and often mixed with wheaten flour for bread.

Oats (*yulaf*) are cultivated chiefly in the plains of Adana and the coastlands of Marmara and the Black Sea, and in many parts of the west and central plateau. Of the 300,000 tons grown in a normal year a little is exported. Spelt (*kaplica*) is a kind of wheat grown for animal fodder; about 90,000 tons a year are produced, mainly in the north-western vilâyets, from Europe to Samsun. Maslin (*mahlût*), a mixture of wheat and rye, is grown on the central plateau and parts of the north and south coast; about 150,000 tons are produced yearly.

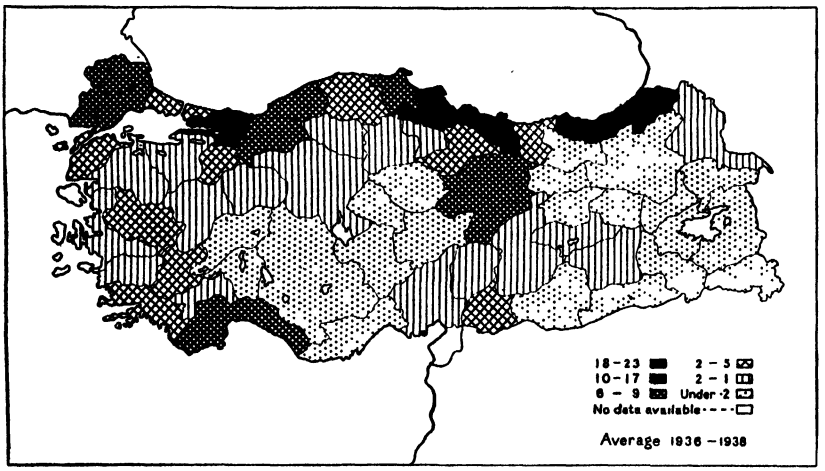


FIG. 29. *Maize and Rice. Yield in tons per square mile*

Millet (*dari*), including sorghum in the Menderes valley and farther south, is grown in many parts, especially the north-west coastlands, European Turkey, the upland valleys of the west and south-west, and south-east Turkey. It is used chiefly as poultry food, but in some places is made into bread. About 55,000–75,000 tons are grown annually, and about 6,000 tons are exported, mainly from Bandirma and Tekirdağ.

Maize (*misir*), the third most important cereal, is grown partly for human consumption as flour, partly for fodder; it thrives best on the damp north coast plains and, with or without irrigation, on moist slopes facing the Aegean (fig. 29). Its cultivation is extending, production having risen to over 750,000 tons in 1940, but only small quantities are exported. Rice (*pirinç*) is a frequent Turkish food, but home production is still inadequate. The chief centres are Antalya and Adana and the marshy plains of the north-west and extreme north-east coast, especially the Porsuk valley and the Bursa, Tosya,

Trabzon, and Diyarbekir districts; but at one time, to check malaria, rice-growing near Bursa was forbidden. As production increased, rice imports fell from 13,500 tons in 1929 to 220 tons in 1939. Production rose to nearly 73,000 tons in 1940, much of which was sent to the subsidized rice-husking mills of Bursa, Tosya, and Maraş.

Canary grass (*Phalaris canariensis*, Turk. *kuşyemi*). Turkey produces one-fifth of the world's total, mainly from the Tekirdağ hinterland and from near Izmir, Tarsus, and Sinop. Production was about 21,000 tons in 1938, but has subsequently fallen on account of the war.

Vegetables

These are grown in most districts, especially the west coast plains. Large-scale development is hindered by summer drought, but market-gardening of all kinds has increased lately, particularly near large towns. Legumes and pulses (*bakliyat*), said to be abnormally rich in proteins, are the commonest vegetable, especially on the plains of the west and south coast. Beans grow almost anywhere, especially in the north and west (fig. 30). An average of 65,000 tons each of haricot (*fasulya*) and broad beans (*bakla*) are grown annually, besides nearly 5,000 tons of wild haricot-beans (*börülce*), and many are dried for export. Chick-peas (*nohut*), green peas, and lentils (*mercimek*) are plentiful, about 75,000 tons of peas and 30,000 tons of lentils being grown annually. Vetches (*fik* and *burçak*) of various kinds are becoming increasingly common for fodder, especially in the western vilâyets and those of Tokat and Gümüşane. About 110,000–135,000 tons are grown each year, of which some is exported from Mersin. Carob or locust beans (*keçiboynuzu*) are common for fodder on the south coast plains, especially near Mersin, Silifke, and Alanya, and to a lesser extent in the Aegean region. About 7,000 tons are grown annually. Soya beans are being grown experimentally near Samsun and Turhal.

Potatoes (*patates*) are widely distributed, except in south-eastern Turkey (fig. 31). Acreage doubled between 1924 and 1939, and imports, once large, have practically ceased. Production reached 320,000 tons in 1940. Onions (*soğan*), garlic (*sarmisak*), and leeks (*prasa*) are favourite vegetables, especially near the Aegean, Marmara, and Black Sea. Other centres are Amasya, Çorum, and Niğde. The best varieties of onions for keeping are those called *kantar topu* from Karacabey, and those from Bursa and Konya. Recent production has averaged nearly 150,000 tons of onions and 24,000 tons of garlic.

Other vegetables, numerous in all markets throughout Turkey, include: tomato, cucumber, lettuce, radish, aubergine ('egg-plant'), water-melon, artichoke, chillies, 'ladies'-fingers', parsnip, beetroot, carrot, black turnip, cabbage, cauliflower, spinach, celery, and others without English names.

Fruit (*meyve*)

Owing to the long sunny summers, ideal for ripening, harvesting, and drying, Turkey has very varied and abundant fruits, many of which form important exports, either fresh or dried, or as syrups and preserves; 'Smyrna' figs and 'Sultana' grapes are particularly famous. Although production fluctuates from year to year according to the weather, the number of trees and the quantity and quality of fruit have improved greatly with scientific measures against blight and insects, the distribution (mainly free) of over 7 million shoots or cuttings, and modern plant and processes for packing and preserving. There are twenty-five fruit institutions—nurseries, model plantations, instruction and research centres—distributing about 4 million grape vines and half a million grafted fruit-trees annually. Turkish fruit exports are said to bring in £T3 millions a year.

Vines and Grapes. Vines (*üzüm*), occupying more than a million acres in 1939, grow particularly well on the western coastlands (photo. 42). The wild vine is native in western Asia, and there were already many cultivated varieties in ancient times. During the last 500 years vine-growing in Turkey has undergone remarkable vicissitudes. In Byzantine days vines were grown principally for wine, but Islam forbade alcohol, and only table-grapes, raisins, and unfermented drinks or syrups were produced under Ottoman rule. Only the Christian minority made some wine and also *raki* (Arab. *arak*), a raw grape-spirit flavoured with aniseed; as much as 154,000 hectolitres (nearly 3·4 million gallons) are still produced annually. In 1887 *phylloxera*, a pest brought by the Orient Express, began to ravage Turkish vines, and American stock—mainly wine-grapes—had to be imported. More set-backs followed: the War of 1914–18, deliberate destruction by the Greeks during the War of Independence, the departure of the Greek and Armenian cultivators afterwards, and destruction by the tobacco-planters immigrating from Thrace, until the failure of this crop forced them to turn to the American wine-grapes. About 2½ million American seedlings were distributed free in 1936; there are also French grafts, e.g. Médoc, Cabarnais, and Chasselas varieties. The State Spirit Monopoly of 1924, by controlling

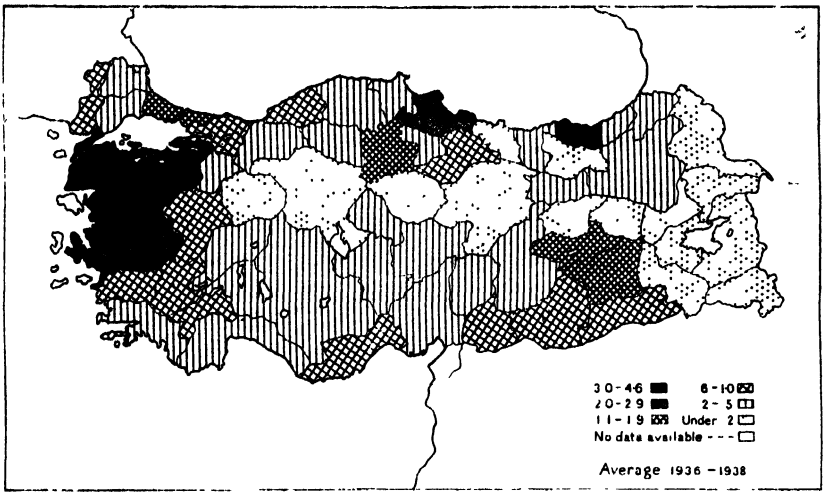


FIG. 30. *Peas and Beans. Yield in tons per square mile*

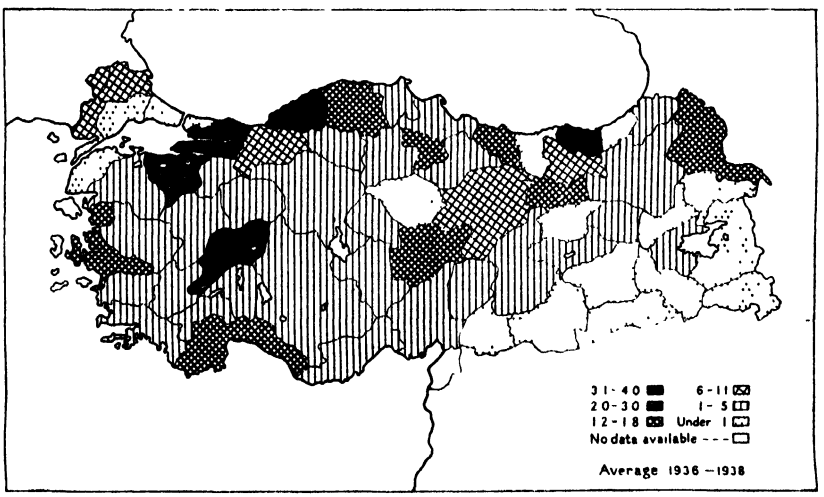


FIG. 31. *Potatoes. Yield in tons per square mile*

all alcohol, satisfied Moslem conscience, and the secularization of Turkey changed the whole outlook. By 1936 the Monopoly, which succeeded a failing Polish Company in 1925, was making a yearly profit of £T6½ millions. Viticulture has greatly improved with modern methods of production, and grape exports rank second to those of tobacco, rivalling similar products from California and Greece. The most important vineyards are in the Izmir region—in the Gediz valley, near Çeşme, Karaburun, Urla, Seferihisar, and Kemalpaşa. Approximately half the grapes are for raisins and sultanas, a quarter for table-grapes, and the rest for wine. From 700 to 1,100 thousand tons of fresh grapes are grown each year, and the Aegean region produces from 30,000 to 80,000 tons of raisins.

Turkish vines usually grow on flat or gently sloping ground with fairly deep fertile soil, up to about 3,000 feet. In the Aegean coastlands they occupy, together with cereals, the centre of most valleys. True raisin-grapes grow mainly south of the Gediz valley, where rains cease before the flowering season; north of the gulf of Izmit, damp winds may spoil flowering, causing poor crops. The difference is shown by the yields: Izmir vines produce about 11 lb. per square foot, Izmit vines only 2¼ lb.

Table-grapes are plentiful everywhere, but the most luscious come from the central plateau and the south-east. Exported table-grapes average 35,000–40,000 tons a year, mainly from the Izmir, Bergama, Dardanelles, Bursa, and Istanbul regions. Railway rates for grape transport are reduced by 30 per cent.

Harvest seasons are as follows:

July–early August: Izmir region, Menderes valley, and south-east Turkey.

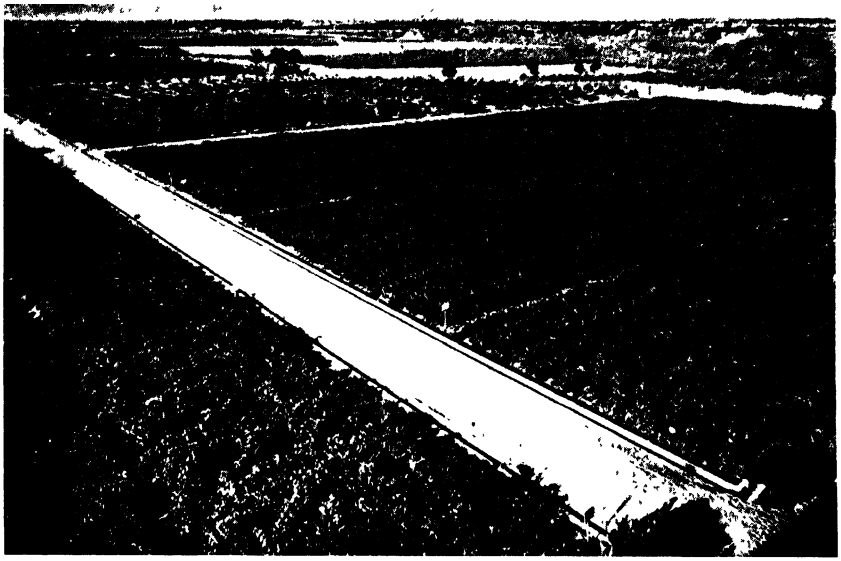
August: Karaburun, Urla, Menemen, Manisa, Akhisar, Kirkağaç, Altinova, and European Turkey.

September–November: Bursa and Kocaeli vilâyets, and European Turkey.

Turkish raisin-grapes are said to be thinner skinned than most others, and richer in proteins, fat, and sugar, as the following analysis shows:

	Water	*Protein*	*Fat*	*Sugar*
Turkish	21·29%	1·88%	0·65%	6·99%
Greek	23·59%	1·42%	0·49%	6·92%
Californian	22·47%	1·61%	0·55%	6·90%

Sultanas are made from the best white seedless *sultaniye* or *sultanina* grapes, raisins from the best *razaki* and muscat grapes; both are small



42. *Vine Nurseries at Manisa*



43. *Open-air drying of Izmir Sultanas*



44. *Fig-trees at Aydin*



45. *Orange Garden near Adana*

sweet grapes of the central west-coast plains; the inferior qualities are used for wine. After being gathered in July and August, they are spread in the sun to dry for about a week (photo. 43), and sent to modern packing plants where the fruit is cleaned, bleached, and packed for export. The busiest season is near the end of August. About 30,000–80,000 tons are exported annually. For wines and spirits see p. 211.

Olives (*zeytin*), occupying about 1,700,000 acres, are more numerous in Turkey than in any other country of the eastern Mediterranean. Their importance is often under-estimated because exports are small; but dried or preserved olives are valuable food, easily stored and lasting well; the oil, of high nutritive value, is essential where animal fats are little used. The most productive regions are the west coast from Kuşadasi to Gemlik,[1] the Taurus slopes near Mersin, and those of Gâvur Dağ near Iskenderon. Some olives grow in the Meriç (Maritsa) valley, but few on the Black Sea shores. The wild olive is native, and common in scrub vegetation; there are many cultivated varieties, propagated by grafting on wild stocks. It is commonly grown at medium altitudes, between the vines and cereals of the plains and the pastures and forests of the uplands; it can stand about 15° F. frost in winter, if the cold is not too sudden or prolonged and if the air is dry and the tree not full of sap. It grows up to 1,000 feet near Samsun and along the Marmara coast, up to 1,600 feet on southern slopes near the Aegean, but not above 800 feet far inland; on the warm south-coast slopes it reaches 2,000 feet, but is more scattered and less important than in the west, except near Iskenderon, where plantations cover 40 square miles. It does not flourish more than from 40 to 60 miles from the coast. Trees grow very large on the rich, damp soils of the alluvial plains, but most of the olive-oil comes from groves in warm, dry, stony, or lime-soil regions. Within these limits olives thrive without irrigation wherever winter rainfall exceeds 8 inches, and, as excessive water lowers the oil content, irrigation is generally avoided. Sometimes cereals and vines are planted beneath the trees. Capital is essential, since olive-trees take some years to mature. The crop is harvested between the end of September and January, or later when the crop is heavy. Turkey is seventh largest producer in Europe, and olive-oil (*zeytinyağı*), once sold to France for refinement, is now extracted in modern factories at Izmir and Kuşadasi; altogether there were eighteen factories in 1938,

[1] In the Bandirma–Gemlik region, containing about 500,000 mature trees, olives are the main crop; the Bursa plain yields over 2,500 tons of oil a year.

the other chief centres being Bursa, Gemlik, Mudanya, Bandirma, Edremit, Burhaniye, Ayvalik, Manisa, Aydin, and Nazilli. About 80 per cent. of the total crop is used for oil, the rest for dried and table olives. Most of the oil is edible, but nine soap factories exist, and oil-press waste goes into cattle-cake.

Figs (*Ficus carica*, Turk: *incir*) are a very important Turkish export. In 1938 there were about 3½ million trees in the Aegean vilâyets—2 millions in Aydin and 1 million in Izmir (photo. 44). The wild fig is native, but there are many cultivated varieties which are grown mainly along valley edges, below the olives. Like the latter, being deep-rooted, they require practically no irrigation, can stand about 15° F. frost (*see* 'Olives'), and intense drought; they also need capital, as the trees take ten years to bear, continuing, however, for another forty years. The flavour of the Turkish fig (said to be due to the numerous ripe seeds, which in turn depend on fertilization by insects found in this climate) has earned a world reputation. The yearly crop averages about 145,000 tons, about a quarter coming from the Aegean region. Twenty thousand tons were exported from Izmir in 1938, mainly from the Menderes valley. Harvest is in August; the figs are dried in the sun, sent to Izmir, sterilized in packing plants, and hand-graded (under hygienic conditions) according to size and quality; the figs lose two-thirds of their weight in the drying process and must be packed within three months after being picked, before the skin hardens.

Other Fruit. Plums (*erik*) (about 3½ million trees) are grown especially in the north-western plains (from Balikesir to Zonguldak), European Turkey, and the plateau 'oases' such as Kütahya, Niğde, Kayseri, Sivas, Erzincan, and Malatya. Yearly production is 45,000–70,000 tons. Many plums are sold fresh (small purple varieties are specially recommended) and about 8,000 tons of dried plums ('prunes') are exported annually. Cherries (*kiraz* and *vişne*), which derive their name from ancient Cerasus (Giresun), are common locally, especially morella and agriot varieties; those from the Black Sea coastlands, Bursa, the Gediz valley, and European Turkey are particularly good. Total production of the different kinds varies between 25,000 and 50,000 tons. Nearly all are consumed locally or made into preserves. Apricots (*kayisi*) are numerous (about 2 million trees), especially in the east (Diyarbekir, Malatya, Kayseri, Erzincan, and Sivas), in the Pontic valleys (e.g. near Amasya, Kastamonu, Çankiri), and on the south coast. Of about 12,000–22,000 tons produced yearly, most are eaten fresh, but 3,000–4,000 tons are canned or dried.

Peaches (about 700,000 trees) grow mainly in the plains of Bursa (50,000 trees), Zonguldak, Tokat, Erzincan, Malatya, Diyarbekir, and the Aegean vilâyets. Production averages 10,000 tons a year *şeftali* peaches, and 50,000 tons *zerdali*. Some are consumed locally, some dried, and some canned; a factory at Bursa is able to can 1,000 tons of peaches annually. Relatively few are exported. Apples (*elma*) of many kinds (about 5½ million trees) grow throughout Turkey, but the chief regions are Niğde,[1] Malatya, Amasya, Kastamonu, Samsun, Gümüşane, and Rize. Production varies between 100,000 and 120,000 tons yearly (about 3,000 tons for export). Pears (*armut*, about 3½ million trees) mostly grow in the northern, western, and plateau vilâyets, and near Lake Van. The crop averages about 83,000 tons (10,000 from Ankara vilâyet). Many varieties are suitable for winter storage. Quinces (*ayva*) are common in moist areas, especially the north coast lowlands (from Bursa to Ordu), and near Kayseri, Antalya, and Diyarbekir. About 30,000 tons a year are produced, for dessert, drying, or 'marmalade'.

Since the removal of land tax on mulberry plantations mulberries (*dut*) have increased rapidly. Serious disease depleted the stock in the early twentieth century, and American trees were imported. Mulberries are grown mainly for silkworms, but the fruit is also eaten. The chief areas are the north-west (especially round Bursa), European Turkey, and the south coast. From 5 million or more trees, 38,000–60,000 tons of mulberries are produced yearly; white mulberries are a special delicacy, but the silk-yield is coarse.

Citrus-fruit production is being increased by the State, mainly on the south and also on the north-east and west coasts. About 150–380 million oranges (*portakal*), of native, Tripoli, and Jaffa varieties, are grown yearly (about half for export), about 30–90 million tangerines (*mandalina*), especially in Içel and Rize vilâyets, 17–37 million lemons (*limon*), and some grapefruit (photo. 45).

Pomegranates are widely grown, especially in the Bursa and Adana plains. Melons and water-melons of excellent quality (about 120,000 tons a year) are cultivated throughout Turkey, especially in the south and west. Bananas (*muz*) are grown on a small scale near Antalya, Mersin, Adana, and Iskenderon. Strawberries and other small fruits thrive on the moist coastlands of the Black Sea and Sea of Marmara, especially near the Gulf of Gemlik.

Nuts, particularly hazel-nuts, are grown and exported in large quantities, chiefly through Izmir, Istanbul, Samsun, and Trabzon.

[1] Production is increasing here with irrigation.

The nuts, containing 40–45 per cent. oil, are used in confectionery and for varnishes, oiling rifle-butts and aeroplane screws, and the waste (rich in nitrates) for cattle-cake. Half the world's hazel-nuts (*fındık*) come from Turkey; they grow mainly in the Pontic forests and occupy half a million acres. The crop in recent years has varied, according to the weather, between 30,000 and 100,000 tons, mainly for export. Walnuts (*ceviz*, 2½ million trees) are widely grown; the best come from the districts of Tokat, Amasya, Kastamonu, European Turkey, Bursa, Simav, Uşak, Ödemiş, Aydin, Denizli, Maraş, Sivas, and Diyarbekir. About 55,000–95,000 tons are produced yearly, some for export. Edible 'Spanish' chestnuts (*kestane*, 4 million trees) grow in many regions, especially the west and north, from Aydin to Çoruh. The annual crop averages 15,000 tons, is harvested in September or October, and exported the following month. Pine-kernels (*çam*) are obtained from many of the southern and western forests, pistachios (*şamfistik*) mainly from the south-east, especially Gaziantep and Maraş (photo. 46). Almonds (*badem*, 2½ million trees) are cultivated throughout Turkey from the wild species, especially in the Bodrum, Ankara, and Elâziz districts; annual production varies from 10,000 to 16,000 tons; about 300–800 tons of kernels are exported. Production of ground-nuts is increasing; about 1,800 tons were produced in 1938, mainly from the dry plateau, south, and south-east regions.

Industrial Crops

These are very important in Turkish economy, providing about £T50 millions of exports a year and supplying many home industries. The chief exports are cotton, tobacco, valonia acorns, opium, silk, liquorice, and dyewoods; crops grown for home use are sugar-beet, sugar-cane, hemp, jute, and aniseed.

Cotton (*pamuk*), the chief industrial crop, occupied about 700,000 acres in 1939 (440,000 in 1927), mainly in the plains round Adana and Mersin (producing about 75 per cent. of the total), Aydin, Izmir, and Manisa (about 18 per cent.), and some near the Sakarya and Kizil Irmak rivers, Malatya, Elâziz, Diyarbekir, and Kars (fig. 32). Production is under State control, but not a monopoly; it has more than trebled since 1929, and Turkey in 1938 was the fourth largest cotton-producer among European States. Cotton requires rich soil, retentive of moisture, but grows up to 4,000 feet on some hills; irrigation is common but not essential. It is often grown in rotation with cereals. Sowing is in March or April, harvest in October. Two

kinds of seed are used: (1) *Yerli*, or 'native', which has short fibre, but fulfils certain needs in spinning, and requires little water; it grows better near Izmir than Adana. Egyptian cotton has been suggested for the Izmir plain, but might not ripen before the autumn rains. (2) *Cleveland* (from America), fine, silky, and with long fibre; it has been spread by three Government research stations near Adana, planting nearly 10,000 acres for seed. New tested seed can be exchanged for old stock every five years. Plantations are generally small,

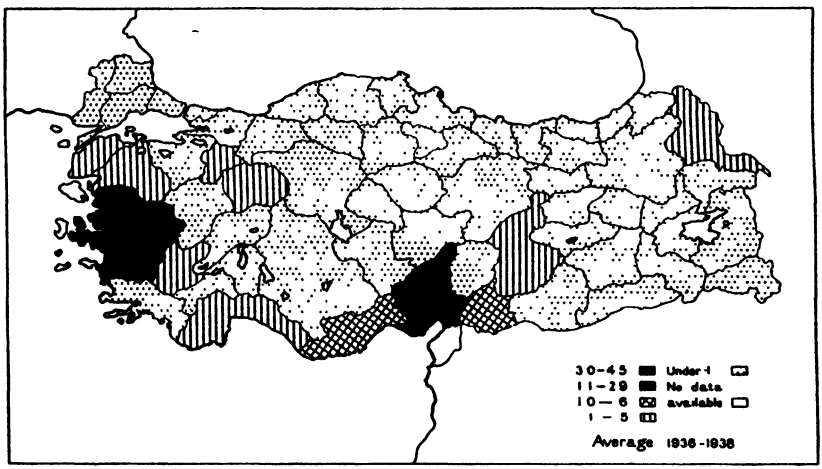


FIG. 32. *Cotton. Yield in tons per square mile*

but may exceed 2,000 acres on the Adana plain, where machinery is widely used by wealthy owners; its use will spread further with increased irrigation from the Seyhan barrage (p. 160). The Turkish cotton crop was 66,000 tons in 1939, 77,000 tons in 1940. About half goes to State mills, one-seventh was exported in 1940, the rest was used locally. Peasants often work in factories for a season, or a few years, to earn capital, and then return to their farms enlightened by experience of modern town life. The best cotton-seed is reserved for next year's sowing, the rest makes cattle-cake. With about 100,000 tons a year Turkey is the greatest cotton-seed producer among European States and sixth in the world. Cotton oilcake makes a valuable cattle-food, and is often mixed with sesame or other oil-seeds to make it more palatable.

Tobacco (*tütün*). This crop has been grown locally in Turkey for nearly 400 years, especially on the rich, warm, damp coastlands of the Aegean, Marmara, and Black Sea (fig. 33). In 1936 production

was limited to suitable areas and brands; cultivation was prohibited in 28 provinces and restricted locally in 17. The best quality comes from the Samsun and Bafra districts. Details of the chief regions are summarized below (principal centres italicized).

	Chief centres	*Description*		*Average yearly production*
Aegean	*Izmir*, Bergama, Soma, Manisa, Ödemiş, Selçuk, Kuşadasi	Good blending quality, light, cool, and mild	greatest quantity	30,000 tons
Black Sea	*Samsun*, *Bafra*, Alaçam, Taşköprü, Trabzon, Artvin	Small thin leaves, sweet-scented, strong, red or yellow	great variety	21,000 tons
Marmara	*Bursa*, Izmit, Hendek, Düzce, Edirne, Istanbul, Silivri	Black seed; red and yellow	strong and sweet	12,500 tons

Production has more than doubled under the State Monopoly, which succeeded the French Régie Company in 1925 and contributes much to the Turkish budget. With about 60,000–70,000 tons a year Turkey is third largest producer among European countries, after Russia and Greece, and an important world exporter. About 135,000 peasants grow tobacco. The seed is sown in March, transplanting is done in May or June; the lower, less valuable leaves are picked in late June and harvesting continues until September when the best leaves at the top are gathered. Marketing is controlled by the Tobacco Trading Company, founded in 1936. There will soon be twelve warehouses, and tobacco and cigarette factories have been reorganized on modern lines by experts (p. 210). Exports in 1939, worth nearly £T40 millions, totalled 43,000 tons.

Sugar-beet (*pancar*), introduced under the Republic, is Turkey's third most important industrial crop. European Turkey and the volcanic regions of the west (Bilecik-Afyonkarahisar) are particularly suitable (fig. 34). Production has increased enormously, mainly because of tax relief, reduced cost of transport and fertilizers, and better prices for growers. Although consumption is increasing, production was almost sufficient (1941) to supply Turkey's home needs in peace-time (about 110,000–120,000 tons), and there may be a surplus for export in the future. In 1941 £T9·7 millions were paid to peasants for sugar-beet, an increase of £T1·4 millions on the previous year. There are subsidized refineries at Alpullu, Uşak (photos. 59, 60), Eskişehir, and Turhal, which produced about 88,000 tons of sugar in 1940, and three more were proposed in the 1938 Four-Year Plan,

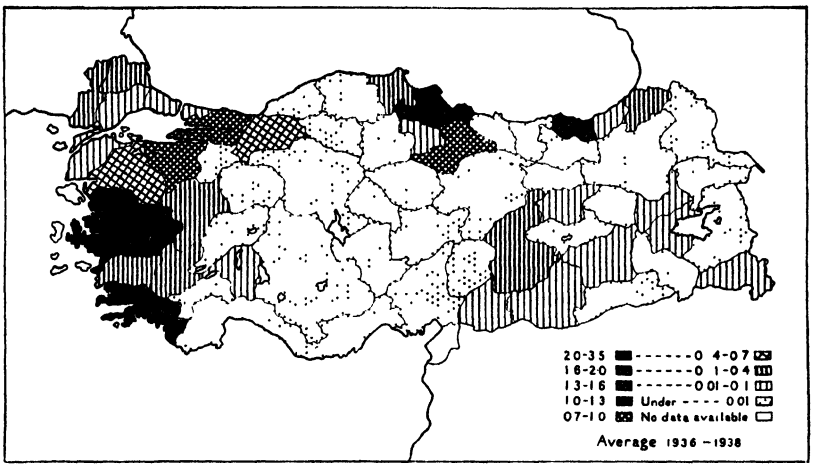


FIG. 33. *Tobacco. Yield in tons per square mile*

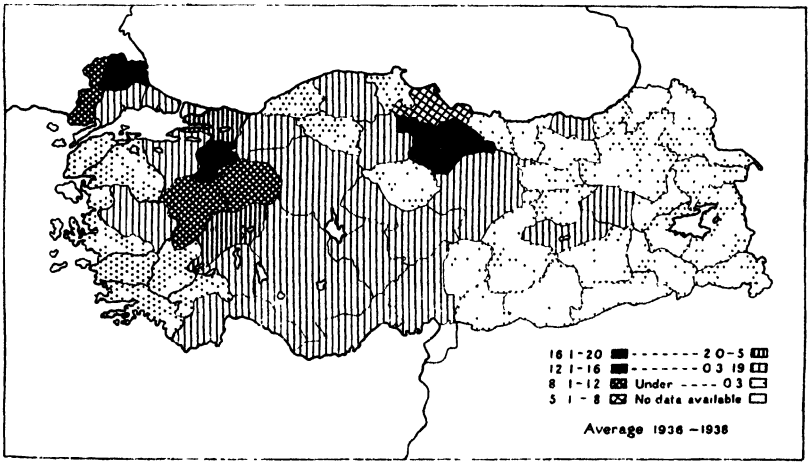


FIG. 34. *Sugar-beet. Yield in tons per square mile*

one at Bandirma and two in the east. In 1939 total production of refined beet-sugar reached 94,000 tons, imports 27,000 tons; in 1940 figures were 89,000 and 10,000 tons respectively, increased prices having reduced consumption. Total production in 1941 was estimated at 85,000–90,000 tons.

About 1,600 tons of sugar-cane were grown on the Adana plain in 1936. Production is increasing.

Sesame (*susam*), the fourth industrial crop, providing very valuable oil, is grown mainly in the plains of the west and south, especially in the vilâyets of Balikesir, Antalya, and Seyhan. It used to be grown among cotton near Adana, but this is discouraged as it exhausts the soil, especially of moisture, since sesame fruit is 80 per cent. water. Harvest is in July and August. An average crop of 35,000 tons was obtained in each year from 1938 to 1940. The oil, almost as fine as olive oil, is used locally for pastry and confectionery, lighting, soap, and perfumery, and the pulp is mixed with cotton-cake for cattle fodder. Some is exported to America for poultry food, through Istanbul, Izmir, and Antalya.

Opium (*afyon*). Turkey and Yugoslavia provide and jointly control 90 per cent. of the world supply of morphia and similar medicines, obtained from the congealed juice of poppy capsules; east of Turkey, opium is an uncontrolled drug; in Turkey it is a controlled medicine. Turkish poppies contain 10–13 per cent. morphia; they grow chiefly in western Turkey, especially near Afyonkarahisar, but also in the Amasya, Konya, and Malatya regions. The poppies cannot stand late frost, cold wind, or heavy rain, but will grow up to 5,000 feet. From May to July the fields are white with flowers (photo. 47), but later turn purple; harvest is from June to August. Production is under a State Monopoly which, buying straight from the growers, curtails prices to compete with Persia and the U.S.S.R. The amount of opium varies but averages about 250 tons a year, most of which is exported (mainly from Izmir). The seed is crushed for oil.

Hemp (*kenevir*) thrives on the rich damp soils of Kastamonu and of other north coast, western, and south-western vilâyets; hemp acreage was increasing steadily until the outbreak of war in 1939. The fibre, even and strong, is used for ropes, sacks, sails, matting, &c. About 9,000 tons a year were produced until 1939 (when the amount decreased), and Turkey hopes to become self-supporting. The new factory at Kastamonu is to consume 6,000 tons a year. Production near Antalya is increasing with irrigation. The seed yields valuable oil for soap, cattle-cake, and other purposes.



46. *Pistachio Nut-trees at Gaziantep*



47. *Poppy-fields near Afyonkarahisar*

Flax (*keten*) is grown in the north-western plains, especially Kocaeli, and along the Black Sea coast. Production is said to have been over 10,000 tons in 1940. From 1923 to 1928 imports cost about £T5 millions a year, but now flax is exported. A new factory will use 6,000 tons a year. Linseed production is also increasing (17,500 tons in 1940), much of the oil being used for cattle-cake. Jute is being grown experimentally in the Antalya district with some success, and a jute industry is planned. Aniseed (*anason*) is grown in the west. Production has recently increased to about 4,000 tons. Aniseed is used to flavour *raki*, a grape spirit (p. 140).

Valonia acorns (*palamut*). Acorn cups of the valonia oak yield valuable tannin. The tree is very common in Turkey, especially in the west, north of Izmir, and also behind Silifke. Annual production from 1937 to 1941 was between 42,000 and 62,000 tons, of which the Izmir region contributed 80 per cent., Çanakkale 15, and the district round Silifke the remainder.

Harvest is between August and October; the first acorns, still attached to the cups and coloured vivid light red, are best. Later they become separate and a duller shade, their tannin content dropping to 25 per cent. The cups are dried in the sun, sent to Istanbul, Çanakkale, Burhaniye, Ayvalik, and Izmir (where there is a factory and most shipments are made) for separation from the acorns; after sorting, about half are sent abroad, the rest are used in Turkey. In 1941 about 4,000 tons were used for tannin and about 26,000 for the manufacture of an extract, *valex*, or *valonex*, which contains about 66 per cent. tannin. Of about 13,000 tons of *valex* produced in 1940, 3,000 tons were for home consumption.

Silk (*ipek*). Sericulture, an old Turkish industry, is carried on near Bursa (where a research station was built in 1930), and in the Kocaeli, Bilecik, Istanbul, Tekirdağ, and Elâziz vilâyets, where mulberries grow well. Production suffered through the emigration of Greeks, and Turkey fell from fourth to seventh silk-producer among European countries; but output is increasing again. Spring is the busy season. Factories at Bursa now number about 80, employing about 3,000 workers and producing £T3½ millions of fabric a year. Consumption increased by 63 per cent. between 1927 and 1930 and by 185 per cent. between 1930 and 1937.

Other Vegetable Products

Tragacanth gum or 'gum-dragon' (*Astragalus gummifer*, Turk: *gavan*). The bush, which grows on the plateau (especially in Ankara,

Yozgat, and Kayseri vilâyets) and in south-east Turkey, exudes a white sticky substance, especially if 'tapped' between July and September when the air is dry. About 350 tons were produced in 1939, 250 in 1940, for lozenges and other medical purposes, and for use in calico-printing, but in competition with synthetic gums and dyes tragacanth is becoming obsolete. *Liquorice* grows wild in the west near Alaşehir and in the Menderes plain, and in the east in the Tigris and Euphrates valleys. Both roots and juice are exported from Izmir, chiefly by tobacco manufacturers in the United States. *Attar of Roses* is still produced in some parts of Turkey, especially on irrigated ground near Isparta, Burdur, Atabey, and Keçiborlu. A factory built at Isparta in 1935 produces about 200 lb. of attar a year. *Dyewoods* and *madder*, once very important in the carpet industry and for export, are decreasing in competition with chemical dyes. *Gallnuts*, from oak trees in the western (e.g. Çanakkale) and Kurdish valleys, are still used locally for dyeing. *Saffron*, a yellow dye obtained from the dried stigmas of saffron crocus (*C. sativus*), a plant native to Cilicia, is still produced in small quantities; about 250–350 tons are exported annually. *Tea* is now grown successfully on the north-east coastlands chiefly near Rize, and Turkey hopes to be self-supporting in this crop by 1945.

DRAINAGE AND IRRIGATION

UNDER the Ottoman Empire little irrigation was practised, and the only large scheme was in German hands near Konya. Since 1936 the country has been divided into twelve regions for irrigation development and over £T80 millions have been voted, including £T50 millions in the 1938 Five-Year Plan. The earthquakes of 1938–41 and the outbreak of war delayed some works, but some have already (1942) been wholly or partially completed. The chief projects are roughly outlined below.

Black Sea Coastlands (fig. 35)

(*a*) *Upper Yeşil Irmak.* A barrage is contemplated at Almus, south of Niksar.

(*b*) *Middle Yeşil Irmak.* (i) The Kazova ('Goose plain'), a lowland of about 25,000 acres near Tokat, is to be irrigated from the Yeşil Irmak in order to grow grain, vines, and sugar-beet. Construction of the Gömenek regulator has begun, and about 20 miles of the main canal towards Turhal have been completed. Many distributary

canals, with tunnels and bridges, are ready and should soon be working (1942). (ii) In the Amasya region, about 5,000 acres of gardens, orchards, and vineyards are to be irrigated by modern methods, instead of waterwheels. (iii) The Tersakan valley, about 6 miles below Havza, is to have a canal on each bank of the river, with a regulator below Lâdik lake.

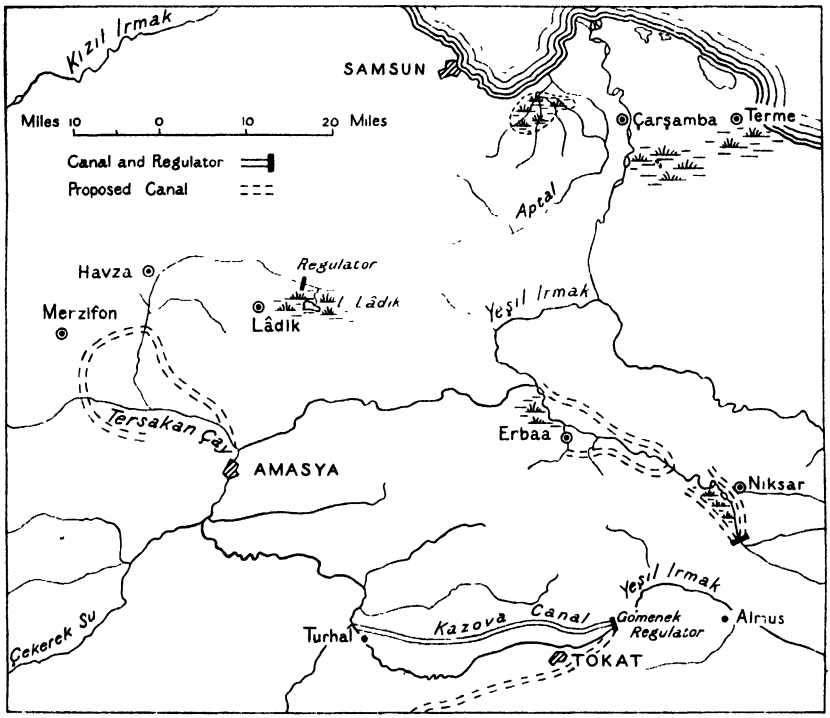


FIG. 35. *Drainage and Irrigation on the Yeşil Irmak*

(*c*) *Yeşil Irmak Delta.* In the Çarşamba plain about 200,000 acres of malarious marsh are to be drained and reclaimed.

(*d*) *Lower Kelkit.* An area of about 27,000 acres in the Erbaa plain is to be irrigated from the Kelkit, with a regulator near the village of Herkümbet, 10 miles from Erbaa, on the way to Niksar, where marsh will be drained. The main canal will end at Çalkaraköy. Grain and cotton will be the principal crops.

(*e*) *Kizil Irmak Basin.* The following works are planned: (i) Irrigation in the plain between Osmancik and Kargi. (ii) Irrigation of the plain from Hamzali to near Iskilip. (iii) Regulation of the Kastamonu

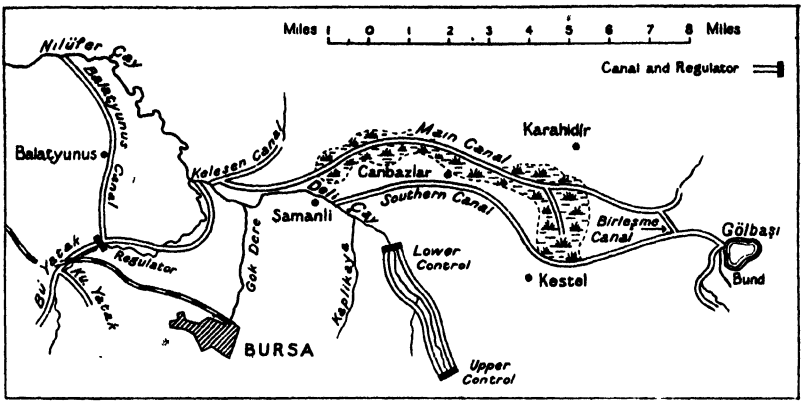


FIG. 36. *Drainage and Irrigation in the Bursa Plain*

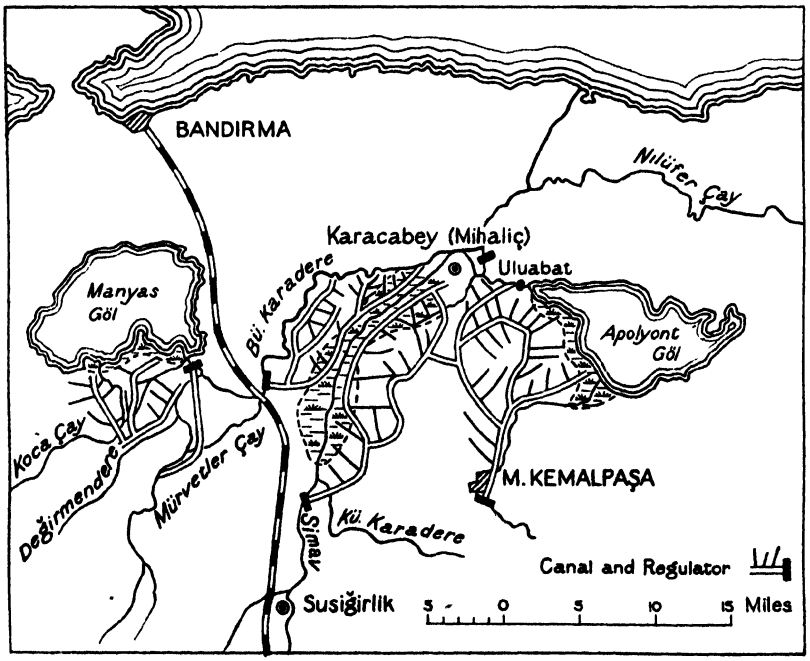


FIG. 37. *Irrigation in the Apolyont–Manyas Region*

river (upper Gök Irmak) and of the gorge of the Osmancik Dere. (iv) Drainage of marsh in the Bafra plain, irrigation of land reclaimed, and river conservancy for navigation. (v) Improvement of old works on the Sinop marshes, at Çankiri, and on branches of the Aci Çay.

(*f*) *Sakarya basin.* (i) There is a project for irrigating the Inegöl–Yenişehir plain with the waters of the Gök Su. (ii) The Pamuk plain (about 50,000 acres) between Mekece and Geyve, which is traversed by the Anatolian railway, is liable to flood in winter. The Sakarya river is now being regulated and the marshes are being drained. With irrigation the plain would become very productive. The Geyve–Izmit road, part of which was destroyed by severe floods in 1941, is now protected by embankments, and the prevention of floods at the lower end of the Geyve gorge is being investigated. Much of the Adapazari plain is often under water; the diversion of surplus water from the Sakarya to Sapanca lake has been suggested. (iii) The Mudurnu marsh (about 25,000 acres) between Adapazari and Hendek is to be drained into the Sakarya; the Mudurnu stream, which feeds the marsh, is being regulated to check flooding. (iv) The Gökçeören marsh (about 8,600 acres), north-west of Adapazari, has been drained by a canal 4 miles long; the surrounding land was cultivated in 1941 and twelve villages freed from fever. Additional canals are being built to complete the drainage scheme.

(*g*) *Izmit–Gulf of Gemlik.* (i) Marshland is to be drained and the basin filled with material dredged from the Gulf of Izmit; by this project 12,000 acres may be brought under cultivation. (ii) The Yalova marshes are also to be drained.

European Turkey

The Meriç river and some of its tributaries are reported to have been protected by embankments in 1939 and 1940. Trees impeding the course of the Meriç and Tunca near Edirne have been cut and protective afforestation is planned in other districts. There is a nursery at Istanbul for this purpose.

Western Anatolia

(*a*) *Simav and Nilüfer Basins.* Thousands of acres of fertile land in the Bursa–Karacabey plain will soon be irrigated from the Nilüfer and Simav rivers, and a wide area protected from floods caused by them and heavy rainfall on the Ulu Dağ. These works include the following: (i) Several irrigation canals are being drawn from the Nilüfer (fig. 36), with a regulator west of Bursa; the new river

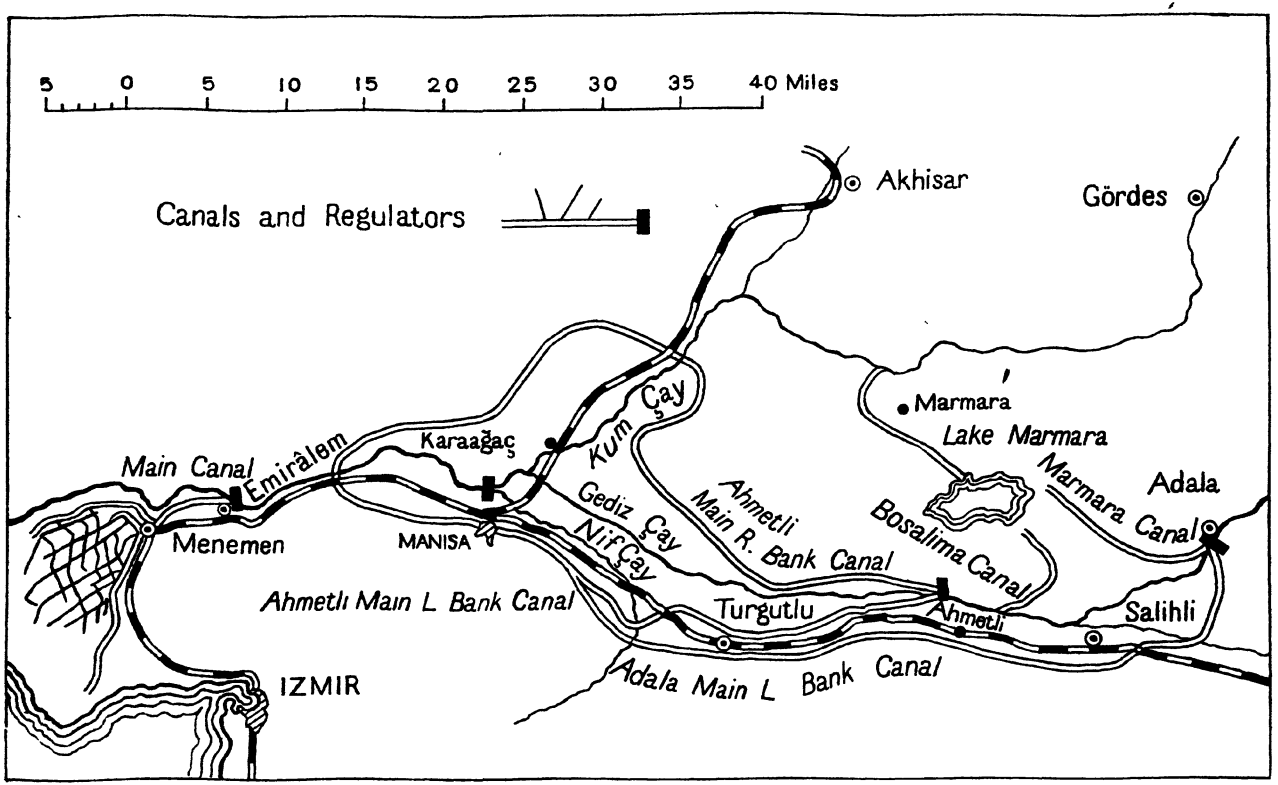


FIG. 38. *Gediz River Irrigation*

embankments, chiefly near Gölbaşi, proved their worth in the severe floods of 1939. The plain is to be reafforested; by 1941 thousands of young trees (especially mulberry and acacia) were growing in nurseries. (ii) In the Apolyont–Manyas region (fig. 37), a main canal with many branches between Mustafa Kemalpaşa and Karacabey, a regulator above M. Kemalpaşa, and another on the Uluabat river, as well as drainage works, are under construction. Embankments are also being built on the left bank of the river to check flooding. (iii) In the Simav valley, between Susiğirlik and Karacabey, about 15 miles of canal are now finished and more are under construction. In the severe floods of 1940 the river cut a new channel by Çeltikçi; the change was welcomed, for water was needed, and the banks are being strengthened to protect the new course. Six miles of embankment are finished and a regulator north of Susiğirlik is nearly ready. (iv) In the Mürvetler–Büyük Karadere region, a bank 3,000 yards long and a flood canal on the Mürvetler river should be completed by the end of 1942, to protect 20,000 acres from flooding; 12,500 acres are already irrigated and other drainage and irrigation canals are being dug. (v) Embankments on the left bank of the Koca river and south of the lake have been finished, thus safeguarding the plain from floods. A regulator was under construction at the exit of Lake Manyas.

(*b*) *Bakir Çay and Bergama Plain.* The Bakir river is liable to serious floods every year, the upper course being impeded by boulders. As much as 55,000 acres may be flooded for several months, thus ruining the land for cultivation. The river is now being widened and regulated by embankments along 45 miles of its course from Soma to the sea; by the end of 1940 about 13 miles inland were completed. Similar works are in progress along the Bergama–Izmir road, where frequent floods caused marsh in the Bergama plain.

(*c*) *Gediz Basin* (fig. 38). (i) A regulator is under construction at Adala, 10 miles north-east of Salihli, where a hydro-electric plant is to be installed (p. 224); a left-bank canal is to irrigate the Alaşehir plain. A regulator near Ahmetli will supply canal water to the right bank of the Gediz; another at Emirâlem was under construction in 1940. (ii) Frequent floods by the Gediz and Kum rivers used to lay waste 62,000 acres annually, while 200,000 acres needed irrigation in the dry summer. The rivers are therefore to be regulated. The Gediz, flow being 650 cubic yards per second in flood, but only 2½ cubic yards per second in summer, has been connected to Marmara Göl. This will form a natural reservoir of over 46,000 million gallons,

capable of supplying abundant water to the plains of Salihli, Turgutlu, and Menemen, which occupy 300,000 acres. The feeder canal about 12 miles long, connecting the Gediz to Marmara lake, is finished. Over 4 miles of the main canal and 500 miles of subsidiary canals were in use in 1940, about 2½ miles of canal near Manisa were opened in 1941, and the rest of the work was well in hand. (iii) The Kesikköy, Seyrekköy, and Ulucak canals in the Gediz delta near Menemen are nearly complete; the first two are now supplying water, the last has had to undergo modification after exceptionally heavy floods. Temporary arrangements have been made for a network of canals in the Menemen plain to irrigate 25,000 acres; about 1,000 miles of canals and distributaries will eventually be dug in this region and nearly 45,000 acres will be irrigated.

(*d*) *Küçük Menderes Valley*. Here also winter floods caused waste land and a heavy death-roll from malaria; until recently the area under water (chiefly near Cellat lake) after heavy rain was over 55,000 acres. Extensive drainage and irrigation works have now been undertaken.

(*e*) *Büyük Menderes Region* (fig. 39). In this region, which once supported a dense population, about 280,000 acres of cultivable land are to be irrigated by the Büyük Menderes, the destructive floods being prevented by dams and regulators. Grain and cotton will be the principal crops. (i) Near Çivril the Işikli dam, on the upper Menderes, is already being built. (ii) A regulator on the Çürük Su, with canals to irrigate land between Denizli and Sarayköy, was to be finished in 1942 or 1943, and plans were in hand for draining and irrigating the Denizli plain. (iii) In the middle Menderes valley a canal from Burhaniye to Nazilli was opened in May 1942, irrigating a large area, and a sluice was to be finished below Burhaniye that year. The Feslek regulator, controlling the Nazilli canal, was scheduled to be completed by the end of 1941, and most of the main canal was finished. Drainage of malarial marsh near Nazilli was to begin in 1942. The Horsunlu–Nazilli canal had been extended and irrigation began in 1940; the complete canal will water over 16,000 acres. The upper part of the canal south of Horsunlu was to be in use by September 1942. (iv) In the lower Menderes valley a regulator is planned at Atça (west of Nazilli) to control two canals, each about 45 miles long and irrigating about 50,000 acres; that on the right bank will extend to Morali (east of Söke) and that on the left bank to Burunköy. The works near Söke and Aydin were well advanced in 1942. (v) The marsh near Milas is to be drained and reclaimed.

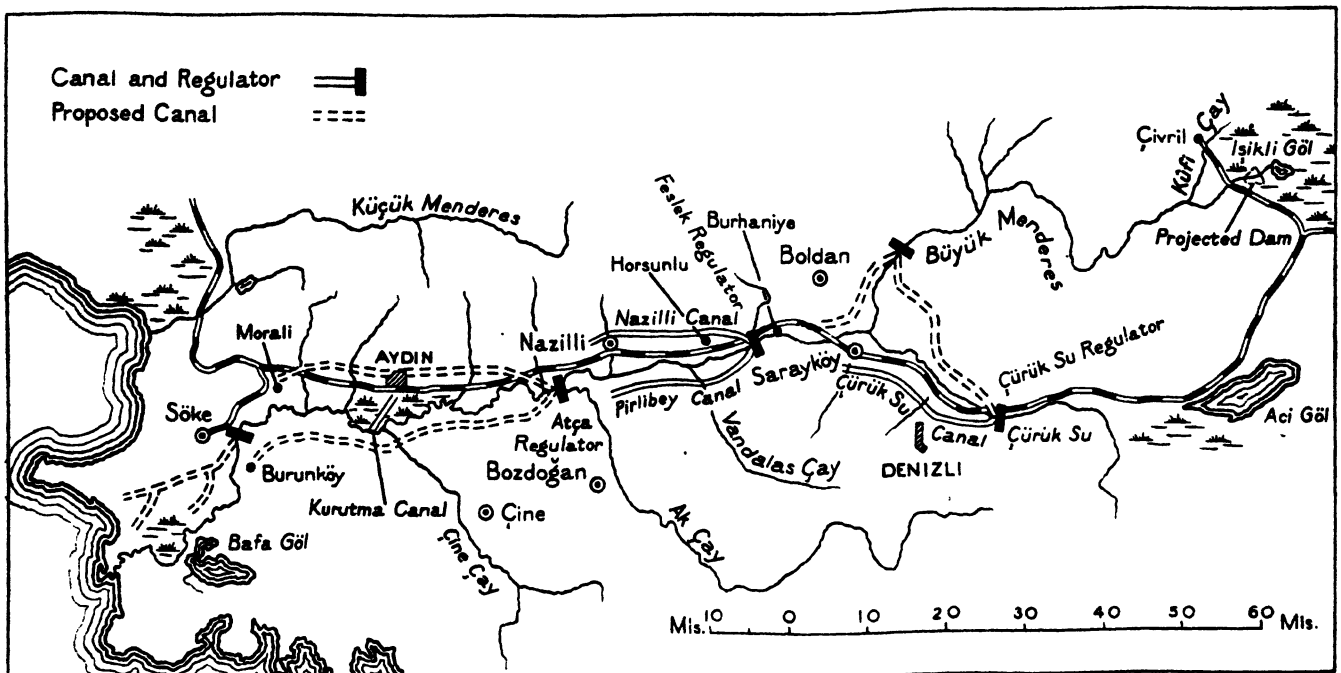


FIG. 39. *Büyük Menderes Irrigation*

Southern Coastlands

(*a*) Plans are being made for draining the Antalya marshes.

(*b*) To increase the cultivation of hemp in the Serik plain a regulator and canal from the perennial Köprü stream are projected.

(*c*) Works on the Manavgat river are planned, for the irrigation of

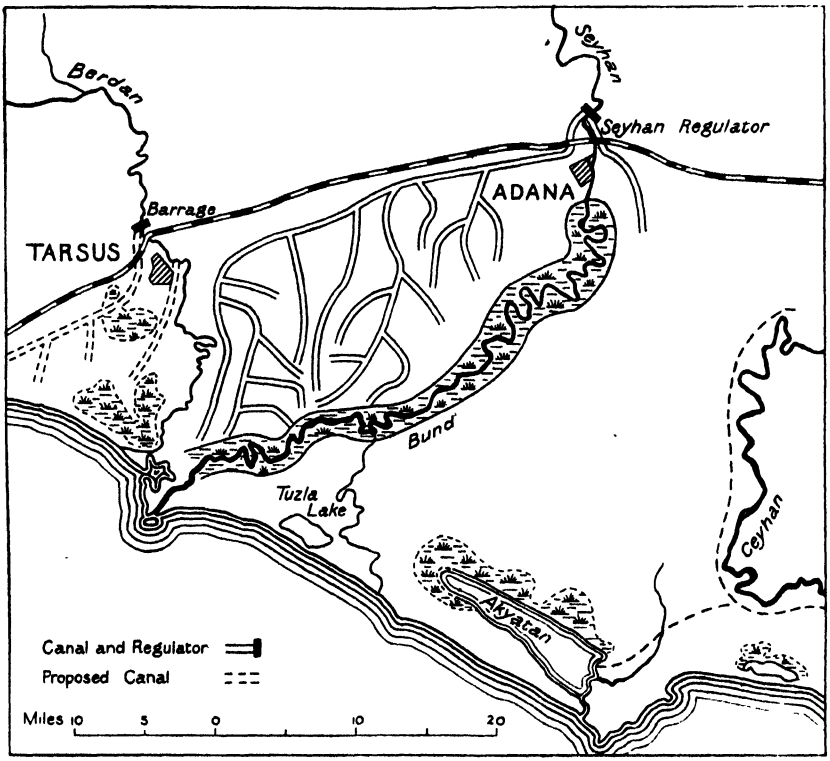


FIG. 40. *Seyhan Lowland Irrigation*

125,000 acres. A hydro-electric station in this district is also under consideration.

(*d*) The irrigation of 50,000 acres by the Dim river near Alanya is projected.

(*e*) Drainage and irrigation works near Silifke are being planned.

(*f*) *The Seyhan lowland* (fig. 40), a plain of about 600,000 acres, for many years subject to devastating floods and containing about 45,000 acres of marsh in the Cinci and Ağba regions, is now being made more productive by works on the Berdan, Seyhan, and Ceyhan

rivers. (i) The Tarsus barrage and 14 miles of main canal (with distributaries) on the Berdan river were opened in 1940. (ii) The Seyhan barrage north of Adana, to hold about 5,375 million gallons of water, was nearly finished in 1942; many works were completed in the plain, including embankments on both sides of the lower Seyhan. A regulator with sluices and distributary canals was already irrigating 112,000 acres on the right bank of the river and 185,000 acres on the left bank. (iii) Embankments and other works are under construction on the Ceyhan.

It is hoped to double the output of cotton throughout the plair within four years. The cutting of canals across present holdings may involve State redistribution of land. Eucalyptus and other suitable trees, for which there is a large nursery at Mersin, are to be planted.

(*g*) Plans are in hand to regulate the Asi (Orontes) and to drain the Amik marshes. £T250,000 have been allocated, and work began in 1941.

Central Plateau

(*a*) *Upper and Middle Sakarya Basin.* (i) Plans are in hand for draining more than 5,000 acres of marsh in the upper Sakarya region. (ii) The Kütahya plain, of 20,000 acres, is to be irrigated from the upper Porsuk, but so far water for only half this area is available. Plans are under consideration for preventing flooding of the Porsuk, and for irrigating the plain of Eskişehir, which is an important sugar-beet region. About 30,000 acres here require irrigation, but at present water is only sufficient for 20,000 acres, and surveys of underground water-supplies are being made. A barrage, 120 feet high and 600 feet long, is planned on the Ince river, 25 miles from Eskişehir, to irrigate 80,000 acres. The water surface will cover 3,000 acres, and the reservoir capacity will be nearly 27,000 million gallons; it will thus be about nine times the size of the Çubuk barrage, and the largest in Turkey. (iii) The Çubuk barrage, 7½ miles north of Ankara, was finished in November 1938 and cost £T5 millions (photo. 48). The reservoir, at present the largest in Turkey, is 4½ miles long, 900,000 square yards in area, and has a capacity of about 3,000 million gallons. It provides nearly 200 gallons per acre for 250,000 people and intensive cultivation is developing. About 25 acres of nursery have been planted with half a million young trees, to protect land around the dam. Fifty thousand trees had been planted by 1942, after which about 20,000 pines will be planted out each year.

(*b*) *Eğridir and Gölcük Lakes.* (i) Plans are in hand to drain the marsh south of Eğridir lake, to make a large embankment, and render 5,000 acres of land productive. (ii) Gölcük lake, south of Isparta, has been found to be fed by underground streams, which will be used to supply a large quantity of water for irrigation.

(*c*) *Çavuşçu Lake.* Marshes in the Ilgin region are to be drained, and local streams regulated for the cultivation of sugar-beet.

(*d*) *Çarşamba Basin.* Much work has been or is being undertaken in the Konya plain (fig. 41). (i) The Keceli river which floods the town of Konya annually is to be regulated. (ii) The Simi, Alkaran, and Balcikhisar canals, built some years ago, have been dredged, and the construction of a right-bank Çarşamba canal and many distributary canals is well advanced. It was hoped to begin irrigation in September 1942. (iii) The important underground water-supplies of the Taurus, especially those of the Obruk lake, are being carefully surveyed, and other sites for barrages and canals are being studied. (iv) *Beyşehir and Suğla Lakes* (fig. 41). Regulators are projected (*a*) on the Sari Su, near Beyşehir, (*b*) near Suğla lake, and (*c*) on the Çarşamba, and irrigation canals are planned.

More than 50,000 trees have been planted in the Konya region—poplars, acacia, oak, apricot, almond, and others.

(*e*) *The Ereğli marshes*, which cover 75,000 acres, are to be drained, and the Ivriz river, which feeds the marsh, is to be regulated.

(*f*) *The Bor District*, it is proposed to irrigate by underground water which is fed by springs in the Taurus and Melendiz mountains. One source recently tapped yielded 140–180 cubic feet of water per second.

(*g*) In the *Niğde region* irrigation is in progress to improve the cattle pastures of the Uzunyayla and the apple-orchards of Niğde. About 40 miles of canal irrigate 12,000 acres of the former. The earthen barrage at Gebere (7 miles from Niğde), completed in 1941, holds up about 336 million gallons of water; the reservoir is fed by the Uzandi Dere and will irrigate over 1,200 acres of orchards and vineyards.

(*h*) At *Sultansazliği.* In the Develi–Sultan plain, south of Erciyas Dağ, about 250,000 acres are covered by reedy marshes. Plans are under consideration to drain them and to irrigate about 37,000 acres between Kayseri and Incesu. About 50,000 acres of the upper Kayseri plain may also be irrigated with water from the Zamanti river, which could also supply a feeder canal 28 miles long to the Sarmisakli river near Bünyan, forming sufficient head of water for a powerful hydro-electric station.

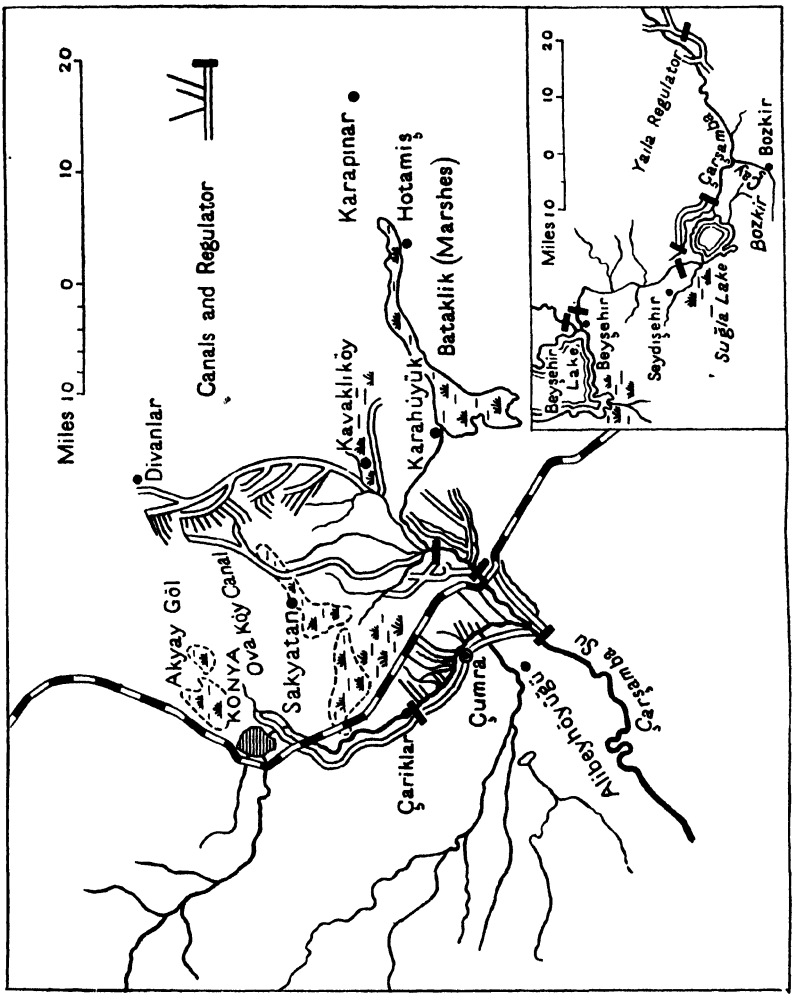


FIG. 41. *Konya Irrigation*

(*i*) *Melendiz Basin.* (i) A barrage is contemplated at Çardakköy in the Melendiz valley, to hold up nearly 336 million gallons of water, some of which will be used to irrigate the Misli plain north-east of Niğde. (ii) It is also hoped that about 18,000 acres will become available for cultivation by the drainage and irrigation of the Sağlikköy marshes south-east of Aksaray.

(*j*) *Middle Kizil Irmak.* (i) Irrigation works are projected in the Avanos–Arapsun region of the Kizil Irmak. (ii) The site for a barrage on Tuzla lake, north of Kayseri, is being reconnoitred.

(*k*) Irrigation works are planned in the Zamanti (upper Seyhan) valley to water the Viranşehir and Pinarbaşi districts.

Eastern Turkey

(*a*) *Euphrates Basin.* (i) Upper Euphrates (fig. 42): Marshlands and seasonal floods used to cover more than 2,500 acres on both banks of the upper Euphrates, near Erzincan; most of the land has now been drained, and 3,000 acres on the right bank are nearly ready for cultivation. Plans are in hand for preventing the Kazkirt river from flooding the new railway. (ii) Irrigation of about 2,000 acres in the Peri plain, south-east of Mazkirt, is under consideration. (iii) Tohma Su Basin (fig. 43): The rivers Derme, Horata, and Sultan, near Malatya, have been partly controlled for some time, but are now being systematically regulated. The deepening of the river-beds has reduced flooding in spring, but lowered the water-level for irrigation in summer. A regulator is now operating on the Derme, 10 miles south of Malatya; from it a canal, 8 miles long, is being made for fruit-growing, for which the region is famed. A second canal linking the Sürgü and Sultan rivers irrigates the Arhaç plain round the Sultan. Another regulator is being built on the Sürgü and a canal was opened in July 1942, to irrigate 300,000 acres.

(*b*) *Gölcük* (*Hazar*) *Lake.* Plans are projected for diverting the Keydan river from flowing into the Euphrates to the Behramaz river, which empties into Gölcük lake. More water would thus be available for irrigating the Ulu plain and for feeding a hydro-electric station.

(*c*) *Aras River.* The Serdarabat barrage on the Aras river near Iğdir, and part of a main canal 12 miles long, have been constructed to irrigate the lowland south of the river, which was formerly subject to drought, but is a potential cotton-region. Rice, millet, and other crops will also be grown.

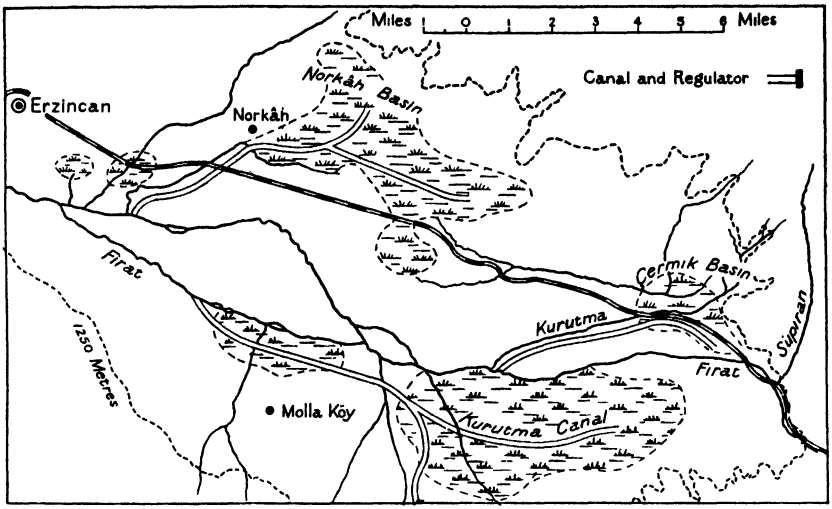


FIG. 42. *Marshland Drainage near Erzincan*

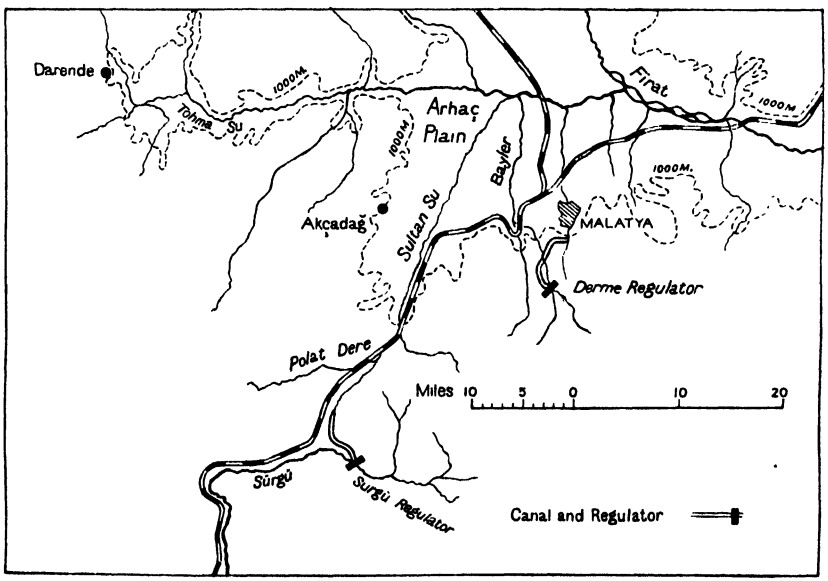


FIG. 43. *Irrigation near Malatya*

FORESTRY

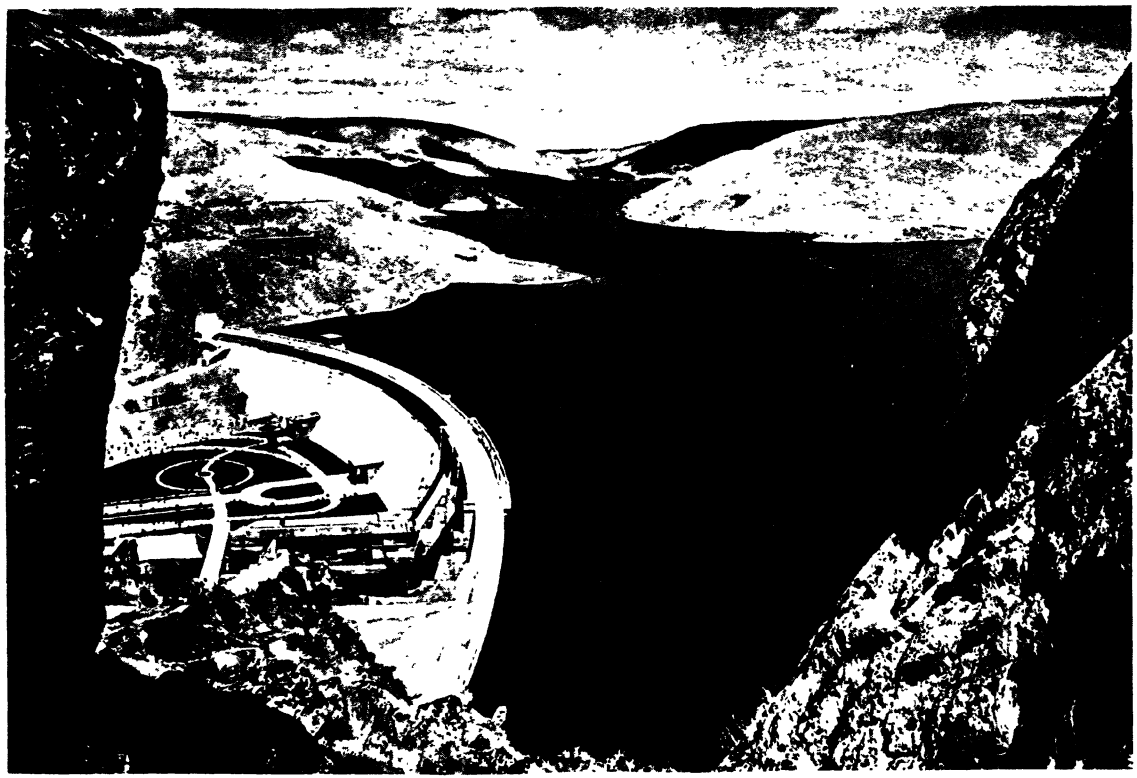
FORESTS occupy about 25 million acres or nearly 12 per cent. of the surface in Turkey (6 per cent. true high-forest, 6 per cent. scrub).[1] They were once much more extensive, but before the Republic, ruthless felling, the nibbling of young shoots by goats, and neglect of afforestation caused serious losses. Inroads during 1914–18, especially in the Taurus, were very severe. Now scientific control is increasing both the number and the quality of trees, and timber is a valuable resource yielding about £T1·5 million profit a year. Since 1937 the State has owned over 90 per cent. of the forests, individuals 5 per cent., and communities and monasteries each 1·5 per cent., so that administration is simplified. Nurseries have been established, foreign experts called in, and forest laws made strict; a Forest Defence Corps and Army conscripts help to prevent fires and illegal cutting. Cutting is only with State permission, and timber firms have to replant areas felled. Forest villages still retain some privileges. Timber may become a State monopoly. It was announced in 1941 that the European side of the Bosporus was to be reafforested.

The chief forests (Vol. I, fig. 64, p. 232) are on the mountains bordering the plateau, particularly on the moist seaward slopes. The most common and useful trees are shown below. The figures are rough estimates.

Hardwoods	*Production (1,000 cu. yds.)*	*Per cent. of forest area*	*Softwoods*	*Production (1,000 cu. yds.)*
Oak	18,440	15%	Pine	312,960
Alder	10,725	35%	Fir	230,640
Hornbeam	6,670		Cedar	22,630
Chestnut	1,700		Juniper	5,750
Elm	1,570	16%	Spruce, yew, and others	*c.* 108,560
Poplar	1,050			
Lime	390			
Plane	260			
Beech, walnut, boxwood, ash, and others	*c.* 130,000	18%		

Hardwoods are best developed on mountains of the north, north-west (including Europe), and the south-east; softwoods on the Pontic, Taurus, European, and plateau mountains. Walnut, whose export is forbidden, is used for rifle butts. Cedar is specially hard and durable,

[1] Estimates vary considerably through different interpretations of 'forest' and inadequate surveying and mapping.



48. *The Çubuk Dam*



49. *Water Buffaloes*



50. *Angora Goats*

and often used for railway sleepers and telegraph posts. Oak (*Quercus pubescens* and *Q. cerris*) is best for charcoal-burning; juniper, like most conifers, is readily inflammable. Of total construction timber produced, pine accounts for about 41 per cent., fir 26 per cent., and oak 2 per cent. Turkey hopes to be self-supporting in most woods, but difficulties of extraction and transport tend to keep production behind demand. Imports of softwoods (from the Balkans) and tropical cabinet or hardwoods total about 196,200 cubic yards a year, but exports are greater—about 327,000–392,000 cubic yards, mainly

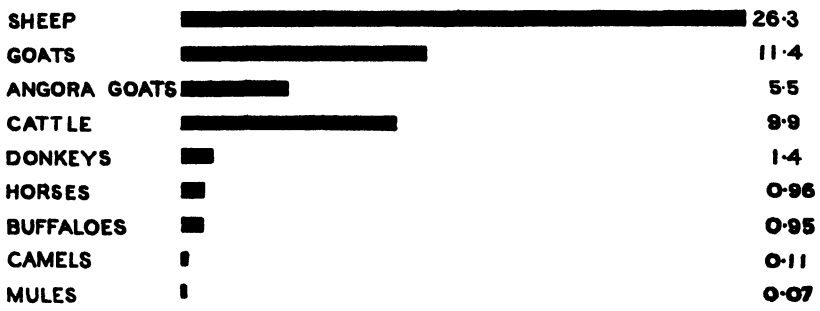


FIG. 44. *Livestock: Millions of Animals in 1940*

pine and fir to Syria and Egypt, and cabinet woods to Europe. The timber is used in numerous saw-mills, several paper-mills, pencil factories, and a cellulose factory (pp. 208-9).

STOCK-RAISING

THE chief animals are sheep, goats, cattle, buffaloes, horses, donkeys, mules, and camels (fig. 44); poultry and bees are numerous, and pigs less uncommon than in days of strict Moslem dislike. Stock-rearing has improved lately and most animals have increased in number, owing to reduced tax and to the introduction of new breeds, better feeding, and veterinary services. Hay is rare, and fodder crops limited; artificial (sown) pasture is being slowly introduced. Until recently, feeding-stuffs were used only for important draught animals and most stock grazed in the open throughout the year. Seasonal migration between winter and summer pastures is habitual in most hilly districts (I, fig. 79, p. 356).

There are three main centres of stock-breeding research: Karacabey

(Mihaliç) in the Bursa lowland, where is the national horse-stud, Sultansuyu, and Çukurova; through these centres 43,000 pure-bred horses and colts were reared in ten years, more than 530,000 inferior animals were sterilized, and over 2,000 bulls and 1,200 merino rams distributed free to farmers. The Ministry of Agriculture has recently created a special stud of 300 bulls to improve stock. The Karacabey stud contains about 550 horses, including pure-bred Arab, English, and 'Nonius' (Anglo-Norman) horses, besides country-bred mares and cross-breeds.

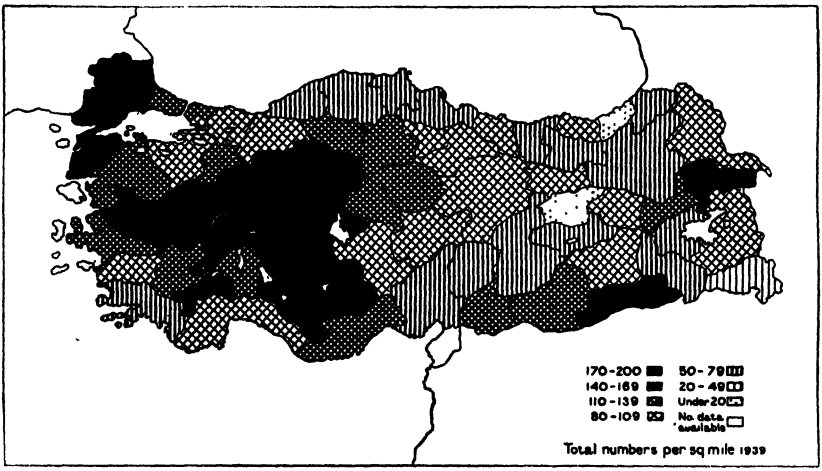


FIG. 45. *Distribution of Sheep and Goats*

Sheep (*koyun*). Sheep are, with goats, the commonest animals, for both graze on sparse vegetation. All nomads have large flocks, especially on the plateau and in the east (fig. 45). Fat-tailed sheep are most frequent; thick-fleeced breeds occur in the south; merinos have recently been introduced, especially in the north-west; they have multiplied from 26,000 in 1926 to 120,000 in 1940, and other sheep are also increasing steadily. Sheep supply some of the milk and most of the meat and wool in Turkey, although meat is not a regular part of a peasant's food. Mutton would be plentiful for troops.

Live sheep and sheep products form a valuable part of Turkish exports. The value of 1936–40 wool production was estimated at £T15–20 millions a year. Turkey is now second producer among European States after the United Kingdom; native wool is unsuitable for very fine cloth, but merino wool should remedy this deficiency. Many local factories are supplied, and wool is exported through

Izmir, Istanbul, and Trabzon. But £T1 million worth was also imported in 1938. First-class varieties come from Afyonkarahisar, Eskişehir, Ankara, Kayseri, and Konya vilâyets; second-class from Erzurum, Trabzon, Ordu, Samsun, and Manisa; it is usually 4 to 6 inches long, or more in European Turkey.

Goats (*kilkeçi* and *tiftik keçi*) are numerous and increasing. They are of two types, ordinary (often black) and Angora (*tiftik*); the former are common in the south, the latter in the west of the plateau, particularly round Ankara, as their name suggests. They only thrive on dry,

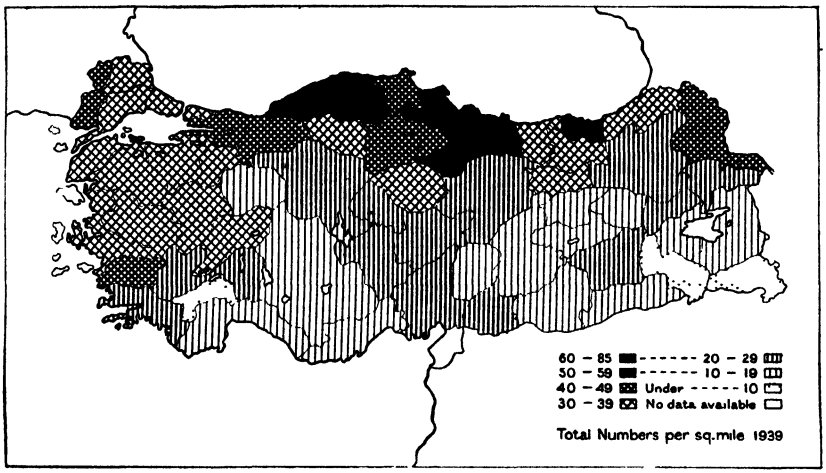


FIG. 46. *Distribution of Cattle and Water-buffaloes*

elevated plateaux. Both provide meat, milk, and hair, the milk often being made into *yağurt* and cheese (photo. 50). The hair of Angora goats (*mohair*) is silky, fluffy, and about 6 inches long, each goat yielding about 4 lb. a year; Turkey and the U.S.A. are the world's chief producers. Annual production is about 7,600 tons; about half is exported and the rest is made into blankets, clothing, mats, &c. Production of ordinary goat-hair rose from 5,900 tons in 1936 to 6,500 in 1938. Goats, goat-hair, and mohair together form an important export.

Cattle (*sığir*) are found in most parts of Turkey except the semi-deserts and mountains (fig. 46), where they are unpopular among nomads as they are difficult to move about. They are often thin, small, and weak-boned, and yield little milk; but the Republic has made great efforts to improve the stock, and numbers are increasing steadily. Until recently oxen were used mainly for draught, though

they compare unfavourably with buffaloes, which do twice the work, live three times as long, but eat twice as much.

New meat-canning factories at Trabzon (to promote stock-rearing in the east), at Kayseri, and at Bursa, were proposed in 1938 under the Four-Year Plan. There are approved abattoirs (*mezbaha*) at Adana, Ankara, Erdek, Haydarpaşa, Izmir, and Karabük.

Smoked beef (*pastirma*) and sausages are made, and much beef and veal consumed (*see below*). Boars' flesh hunted in the west, near Izmir and Bursa, is frequently eaten, except by strict Moslems, and an Austrian firm is trying to build a factory for tinning this meat. Since the departure of Greeks and Armenians from the western plains, boars have become a menace to crops, and shooting-parties are encouraged.

Dairy cattle are now reared on the south coast plains, the damp grassy lowlands of the north-west, between Istanbul and Edirne, and in eastern Turkey. Meat and milk production (1940) is shown below:

Total No. of animals slaughtered		*Total weight in tons*		*Milk (tons)*	
Sheep	1,783,350	Mutton	29,400	Cows	1,160,500
Lambs	973,250	Beef	23,000	Buffaloes	380,540
Goats	539,800	Goat	9,520	Ewes	713,090
Cattle	318,000	Lamb	5,570	Goats	578,490
Kids	133,450	Veal	3,000	Angora goats	36,650
Calves	96,700	Buffalo	4,180		
Angora goats	86,150	Angora goat	1,130		
Buffaloes	33,000	Kid	740		
Young buffaloes	7,950	Young buffalo	450		
Pigs	2,450	Camel	200		
Camels	1,100	Pork	100		
Young camels	1,350	Young camel	30		
1940 total	3,976,550		77,320		2,869,270
1936 total	3,302,050		57,470		2,323,500
Increase	674,500		19,850		545,770

Much butter, cheese, and *yağurt* are made. Butter is exported from Trabzon, and a milk-powder factory is to be built at Bursa, in addition to one at Kars which has been working since 1937. Cheese (40,000 tons a year) of three main types is often of excellent quality: *Edirne*, a white cheese exported (like *yağurt*) from Silivri; *kaşer*, produced especially round the Sea of Marmara, Çanakkale, Ayvalik, and Izmir; *gravyer* (French gruyère), made near Kars and in other eastern districts. *Yağurt* is frequently made from the curdled milk of cows, goats, ewes, or buffaloes. The milk is simmered, poured into

bowls, cooled, and at a certain temperature a small spoonful of old *yağurt* carefully added. When cold, *yağurt* is firm, solid, and has no acidity for about 12 hours. It is eaten daily by nomads and said to be more wholesome than raw milk. Other milk products under various names are both local and widespread.

Water Buffaloes (*manda*) (photo. 49) are important in the plains of the west and north and of the lower Meriç (fig. 46). They are often preferred to oxen as they are stronger, and do most of the ploughing.

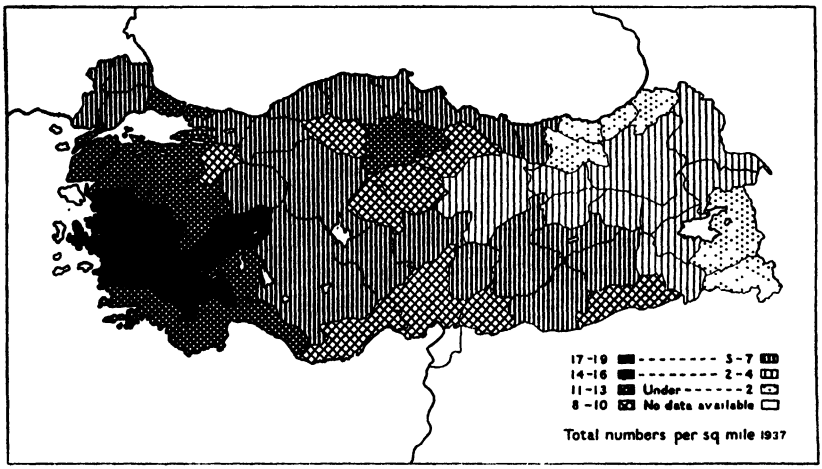


FIG. 47. *Distribution of Horses, Mules, Donkeys, and Camels*

They provide nearly 2,000 tons of meat a year, and their milk, rich in cream, makes excellent *yağurt*. Many are exported.

Horses (*at*) are found nearly everywhere in Turkey, especially in the west and south. Even on the dry plateaux most small villages possess two or three (fig. 47). They are mainly of Turkish stock, though some are Arab, small (about 13–14 hands high), but good hardy workers. Carrying a load of 200 lb. they can travel about 25 miles a day at 3 m.p.h. or, with a lighter load, 30 miles at 3½ m.p.h. They are used mainly for baggage or riding, never for ploughing; horse-racing is becoming increasingly popular. On the plains they occasionally draw light carts or 4-wheeled wagons requiring a team of four. They are fed mainly on chopped straw (*saman*) with a little barley, and green stuff only in spring—a diet unsuited to foreign horses. A national stud was founded at Karacabey in 1924, where the Turk, always a great horse-lover, is breeding excellent horses, often from English pedigree stock.

Donkeys (*eşek*) are the most popular transport animals, especially among the poor peasants.[1] They are cheap, hardy workers, sure-footed, and eat little. They are bred in small numbers in most districts, especially in the western plains, on the plateau, and in the south, near Adana; stallions have latterly been imported from Cyprus.

Mules (*katir*) are found in many districts, particularly in the south-west and east, but they are insufficient to supply army transport in large numbers. Many used to be imported from Khios, Lesbos, and Samos, but they are now bred in Turkey, especially near Adana, some sires being imported from Cyprus. They stand 13–14 hands high, like Turkish horses, combining the strength of the mare with the wiry toughness of the donkey, and eat slightly less than a horse. They can carry 250–300 lb. and their surefootedness makes them invaluable on steep, rough mountain tracks. Some are exported.

Camels (*deve*) are most numerous in southern and western Turkey and throughout the central plateau, but their numbers have decreased slightly in recent years with increasing mechanical transport. The common type is the *tulu*, a cross between the dromedary and the two-humped Bactrian camel. With one hump, it has the weight and strength of the Bactrian, and stands cold weather well. Bactrian camels are also found on the Adana plain. A Bactrian and *tulu* camel can travel 12–15 miles a day, with a load of 600 lb.; the Syrian dromedary carries only 500 lb. Tents, sacks, and other goods are made locally from camel-hair.

Pigs (*domuz*), through Moslem repugnance, were rare in Turkey until recently, but they are increasing, mainly on the plateau and in the west. Near Trabzon, and also Adana, they are liable to damage crops, especially maize.

Large, fierce, wolfish-looking dogs are kept on most Turkish farms. On the plateau they are often cream-coloured and wear long-spiked collars to withstand wolves. The Karamanian sheep-dogs of Taurus and the south coast plains are huge, woolly, and very fierce, resembling those of Albania; they are white, iron-grey, or dark-coloured. The packs of scavenger-dogs which formerly infested Istanbul have been exterminated.

Poultry (*tavuk*) are ubiquitous, especially in grain-growing regions, such as the western plateau. Fowls are commonest, but turkeys and some geese and ducks are also kept. Numbers are increasing. The flesh is often eaten and eggs are universal food. The best egg-producing regions are the coastlands; rather more than a thousand million

[1] Donkeys are forbidden in the city of Istanbul.

eggs are produced each year; about 4,750 tons were exported in 1940 and 77,000 head of poultry in 1935. Many shipments go through Ordu, Giresun, Fatsa, Bartin, Bandirma, Izmir, Antalya, and Mersin, which are specially 'licensed' and have inspection and port facilities. Samsun is to have a cold-storage warehouse for 50,000 cases of eggs.

Bees (*ari*) are widely kept; there were about 1,143,000 hives in 1940, 29,000 of modern design. Annual production of honey averages 47,000–54,000 tons, wax 525–600 tons, according to the weather. The best qualities come from Bursa, Bandirma, Edremit, Kirkağaç, Izmir, Antalya, Mersin, Adana, Ankara, Kayseri, and Kars; some is exported through Istanbul, Bandirma, and Izmir. Turkish wax is valued abroad for its purity.

Hides, Skins, and Furs

Together these form an important export, although Turkey uses many of the hides at home and also imports several thousand tons of leather annually. A subsidized tanning factory (using valonia acorns) exists at Yalvaç. Furs, obtained from most parts of Turkey, provide about £T400,000–800,000 of exports a year. The principal market is Istanbul.

	Annual average No. of furs	*Chief districts*
Rabbit and hare	1,100,000	Central and western plateaux and southern coastlands.
Fox	150,000	Erzurum–Kars and all forests from Konya to Bandirma.
Marten	30,000	Kayseri–Erzurum.
Badger	15,000	All Anatolia, especially near Black Sea.
Jackal	10,000	Marmara region.
Wildcat	10,000	..
Sable	8,000	Along rivers between Adapazari and Kastamonu.
Beaver[1]	5,000	Most rivers.
Wolf	5,000	Plateau.
Cat	1,900	..
Polecat	800	..
Lynx	800	Eastern mountains.
	1,336,500	

[1] Used especially for shaving and paint brushes. Most exported to Germany.

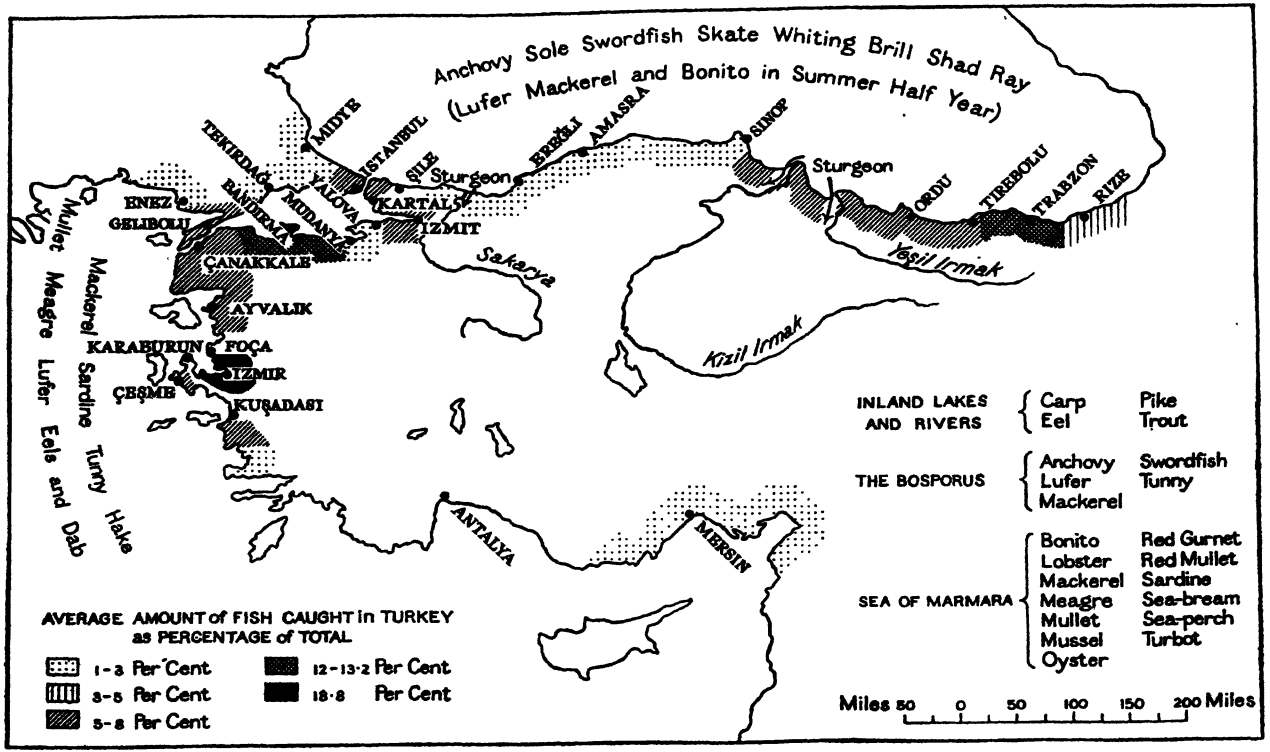


FIG. 48. *The Chief Fishing Regions*

FISHING

FISHING is widespread all along the rugged coast and in the numerous rivers, lagoons, and lakes, but primitive fishing methods and lack of inland communications hinder development of the industry. Foreign experts have been appointed and an Institute of Fisheries has been established. With improved organization and modern equipment the Turkish fishing industry should become important.

Sea-fish are plentiful and varied in all Turkish waters (fig. 48). The Black Sea waters, however, contain sulphuretted hydrogen below

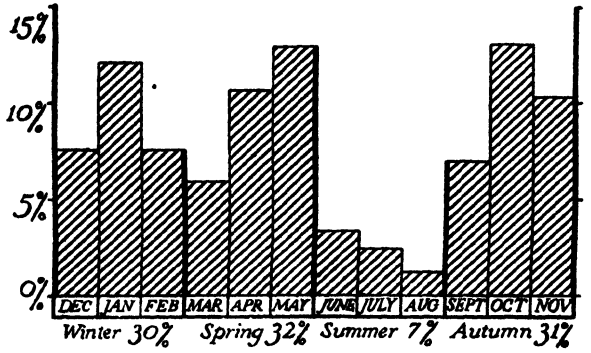


FIG. 49. *Monthly and Seasonal Percentages of Fish caught*

about 650 feet, so that fish are restricted to the surface layers, which are exposed to severe storms in winter. Many fish, therefore, migrate from the Black Sea to the sheltered deeps of the Sea of Marmara or the Mediterranean in autumn, returning north in spring. Many are caught in transit, and most varieties can be bought throughout the year at Istanbul (Turkey's Billingsgate), where 50–80 per cent. of Turkey's fish are marketed. The best fishing-seasons are shown in fig. 49; special seasons in the Bosporus are:

Beginning of June–end of August: Sardines, skate, and swordfish.
Beginning of September–end of November: Bonito.
Mid-November–end of April: Mackerel and herring.
Beginning of December–end of March: Anchovy.

The maximum catch in spring is due to the migration of fish both northwards, and, locally, into the warm, sheltered bays, lagoons, and river-mouths of the west coast. The chief species caught are bonito, tunny, sword-fish, lufer, mackerel, herring, sardine, and anchovy.

Summer (June to August) is generally a slack season, although

some bonito, mackerel, and herring are caught, and also sardines and tunny, which are late in migrating northwards. Bonito, caught mainly in the Black Sea, supply about one-fifth of the total catch in June, sardines about one-third of the catch in August. Tunny, one of the largest fishes of the mackerel family, and akin to bonito, is frequently caught in the Sea of Marmara, and in the Black Sea after June. Excellent turbot is also caught in the Black Sea.

Fishing revives in September with the southward migrations, tunny and bonito providing 30–40 per cent. of the catch. After the migrations cease in November, fishermen are active during the winter in the Marmara and the Aegean, where the weather is less severe than in the Black Sea. About 50 per cent. of the catch is anchovy, 10 per cent. bonito, and much of the rest mackerel. Anchovy, being hardy, is frequently caught in the Black Sea. Fishing along the Mediterranean shore is on a smaller scale, the chief centres being Mersin and the mouth of the Seyhan (where there is a fishing barrage).

Much fish is preserved, especially mackerel and herrings, and forms a valuable food reserve. A canning industry is being developed at Kartal and Söke. A canning factory at Trabzon is said to be responsible for the scarcity of porpoise now in the Black Sea. *Caviare* is made from the roe of sturgeon, which move up the Sakarya, Kizil, and Yeşil Irmak, and other rivers to spawn in early summer. *Botargo* or *boutargue* (like caviare) is made from the roe of mullet which frequent the west coast bays, lagoons, and lower river stretches in spring.

Fresh-water fish are mainly trout, carp, pike, eels, and large coarse fish (I, chap. vi). These are caught in all inland lakes and rivers which are not too salt or muddy, but only Lake Van is an important fishing-centre, as fish is not popular elsewhere on the plateau. No commercial development of inland fisheries is expected.

About 20,000 tons of fresh fish were exported in 1939 (an increase on previous years) and 1,575 tons of dried or canned fish.

Sponges

About 20 tons a year are collected from the Aegean and Mediterranean, especially near Bodrum and Marmaris (about 15 tons in 1934, 8 tons in 1935), but the best grounds are in Italian territorial waters and are jealously guarded. Primitive methods, i.e. hooks and divers, are still used, but the industry is now State-controlled (through the Sungercilik T.A.S., which is under the Sümer Bank). Capitalization and improvement are planned, but the specialized modern equipment is very expensive.

CHAPTER XV

BANKING, INDUSTRIES, AND COMMERCE

BANKING

Retrospect

UNDER Ottoman rule almost all financial business was in foreign hands, and successive attempts to create a Turkish bank had failed. From the days of Mohammed the Conqueror the bankers of Galata, mainly Genoese, had supplied the Sultans with ready money in emergencies, and received substantial privileges and concessions. In 1845 some of their successors formed a *Bank of Constantinople*, but it was mismanaged and was dissolved during the Crimean War. When the Tanzimat reforms allowed foreigners to hold property and establish businesses in Turkey, its place was taken by the *Ottoman Bank* (1853), a joint-stock company whose shares were held by British and French nationals. This was incorporated under Turkish law, but managed by committees in London and Paris. In 1863 it received a concession, as the *Imperial Ottoman Bank*, to administer Turkey's foreign loans, first contracted during the Crimean War (1855), and it became the 'treasurer at large' for the State, financing railways and public works, the tobacco monopoly (*Régie*), and other enterprises. Its concession was revised in 1925 and renewed in 1933 until 1952. Its Istanbul managers and board of directors are now nominated by the Government, and the general manager is appointed subject to the approval of the Minister of Finance, but the bank receives all its directions from its committees in London and Paris. Its capital is £T10,000,000 half paid up. Its notes are legal tender, and must be redeemed in gold when the bank's concession ends. Many of its functions as Government banker have now been assumed by the Central Bank and Agricultural Bank, but it still has over sixty branches in Turkey, and others in Egypt, Palestine, and elsewhere in the Near East; it makes payments abroad on behalf of the Treasury; and is the principal agent of British and French interests in Turkey.

Other foreign banks, such as the French *Crédit Lyonnais*, the German *Deutsche Bank*, and the Italian *Banca di Roma*, transact the foreign business of their nationals, and the Deutsche Bank administers the remaining German enterprises. But none has the same official standing as the Ottoman Bank, now no longer 'Imperial'; and Turkish banks formed in imitation of it, or as rivals to it, the

Société Générale de l'Empire Ottoman (1864), the *Crédit Général Ottoman* (1869–99), and the *Société Ottomane de Change et de Valeurs* (1872–99), were shortlived. The *Bank of Salonica* (1888) survives; all the new banks established after the Young Turk Revolution in 1908 ceased to operate in 1914; and the *Ottoman National Credit Bank* (1907) was merged in 1927 in the *Türkiye Iş Bankasi* of 1924 (p. 181). Only the Agricultural Bank (1888) and the Savings Bank (1868) survived the Revolution, and were reconstituted in 1924 and 1927. For their special functions and history see pp. 180 ff.

Background

The signature of the Armistice at Mudros on 30 December 1918 was not, for Turkey, the end of the Great War. Defeated after four years of fighting on four fronts, and seemingly at the end of her resources, Turkey nevertheless took up arms again within two years against the Greeks. The Armistice which ended the War of Independence was signed at Mudanya on 11 October 1922, almost exactly four years after the Armistice of Mudros. Thus, for Turkey, the Great War lasted eight years instead of four.

The end of the struggle found Turkey in desperate straits: her empire was destroyed; her population was reduced by battle, pestilence, and hunger; her agriculture was at a standstill, for she had been deprived for eight years of her best man-power, and she was now to lose the skilled husbandry of the Anatolian Greeks. The machinery of her slender industries was worn out. An immense task of reconstruction, therefore, confronted Mustafa Kemal and his associates (I, ch. VIII, pp. 333 ff.).

They devoted the earlier days of the Republic to the more urgent problems: the termination of the allied occupation; the exchange of populations with Greece; the establishment of the national capital at Ankara; the abolition of the Caliphate; the elaboration of the organic statutes of the Republic; the secularization of schools; the emancipation of women; the adoption of the Latin alphabet and European dress; and the promulgation of the new civil, penal, and commercial codes.

By the middle of 1928 the broad fundamental changes had been accomplished, and the ground was cleared for more specific action. For several years, however, a considerable proportion of the available capital was directed to the extension of the Anatolian railways and the buying-out of foreign railway concessions (p. 240). The result was that, when the world-wide economic crisis broke in 1931, Turkey was

severely affected. Although the railway programme was steadily pursued, a fresh economic start was made in 1933 and 1934 by the drawing up of a Five-Year Plan of Industrialization, adopted on 9 January 1934 (for details *see* p. 198). Twelve days later a financial agreement with the Soviet Government provided Turkey with a credit of 8 million gold dollars (increased in 1935 to 10 millions) for the equipment of cotton mills. This was followed by a British credit of £10 millions and one from Germany of Rm. 150 millions. In addition, the award of the contract for the metallurgical works at Karabük to a British-American firm in June 1936 involved a British credit of £2,500,000 (p. 215). Later still, a further British credit of about £6 millions was granted for rearmament purposes.

The Financial Problem

The Government of the Republic had already begun to give particular attention to the development of industry, although the movement did not really get into its stride until the promulgation of the First Five-Year Plan in 1934. Kemal and his associates fully recognized that Turkey was, and would always remain, pre-eminently an agricultural country; but they were determined to introduce a balance into the economic life of the country by the establishment of industries, based as far as possible upon raw materials which the country produced. They were faced, however, with the problem of capital: Turkey's citizens were poor and the amount of free capital in private hands was wholly inadequate to carry out the wide programme which they planned. They refused to consider foreign long-term loans, which were associated in their minds with foreign exploitation and economic dependence. Although culturally they were inclined to distrust State ownership, and preferred to rely upon private enterprise, yet they realized that without the help of State capital their plans could not be carried out. They were influenced, too, in their consideration of the problem, by their geographical and political proximity to Russia, and by the success of their own Agricultural Bank, which had survived the Revolution, after enlargement of its scope in 1916.

In the end, they steered a middle course: private enterprise was maintained and indeed encouraged, but a technique was devised, partly borrowed from the Russians, of indirect control of State enterprises, which is one of the most interesting and fruitful achievements of new Turkey. It is a technique which might well be studied by those backward countries which are anxious to develop

their resources and vary their economy without invoking the support of foreign capital. At the same time there are some who, while recognizing some of its merits during a period of prolonged peace and reconstruction, hold that it would not stand the strain of war.

Briefly, the system consisted in the foundation of a number of State-owned banks, to each of which is relegated the task of establishing and controlling certain industries. With these banks, and by a judicious use of propaganda in the country, the Government of the Republic was able to utilize the savings of the people to finance State enterprises. These savings would not otherwise have been made available, because most Turkish people are ignorant of the technique or advantages of investment. It is clear from the Banking Law of 1 June 1936 that the policy of appointing the State banks to glean the savings of the small man for the financing of State undertakings was deliberate. Although Art. 20 of the Law protected deposits by limiting credits to borrowers, Art. 22 declared that 'banks may undertake industrial business, directly or by participation, but their investments must not exceed their paid-up capital *plus* their reserves'. Moreover, the next paragraph excluded State enterprises even from these restrictions: 'Nevertheless these restrictions do not apply where banks participate in State industries concurrently with the State, or with State enterprises of State banks', and thereby placed the entire funds of the State banks at the disposal of State industries.

The extraordinary increase in deposits which became available to the banks for this purpose was an indication of the growing wealth of the country, and the confidence of the people in their rulers and in the honesty and stability of their institutions. Between 1924 and the end of 1940 the combined deposits of all the national banks increased from 13 million to 275 million Turkish pounds; and between 1927 and 1940 the output of Turkish industries increased in value from 32 millions to 331 millions.

The participation of foreign capital in industry for specific and temporary objects was not definitely rejected; and in certain cases credits granted to the industry itself by foreign suppliers of machinery were countenanced. But long-term Government loans for unspecified purposes were banned.

The Banks and their Function in Economic and Social Development

The economic activities of the Republic were confided to the new banks—semi-State institutions financed and largely controlled by the Government to assist in the completion and operation of wide

industrial plans—in accordance with the table on page 185. The intention was, as far as possible, to confide to a single bank a group of State enterprises. Although there has been some overlapping, the position is being regularized by regrouping. Thus the State mining interests of the Sümer Bank (which has been placed in control of the State textile industries particularly) are being transferred to the Eti Bank, which is charged with the development of State mining.

The Agricultural Bank was already in existence. It originated from the 'Farm Credit' institutions (*comptoirs*) established in 1863 to continue the pioneer efforts of Midhat Pasha, under the Imperial Decree of 18 March 1856, to restrain the money-lenders of the Danubian provinces. In spite of Government subsidies, reckless mismanagement and the Russian War of 1878 led to their reorganization in 1888 as a single Agricultural Bank (*Ziraat Bankasi*) 'to advance money to farmers either on the pledge of real estate, or against sound securities', which was expanded in 1916 and survived the Revolution, though some of its branch offices were damaged. By a law of 1924 it was reconstituted as a stock company with a capital of £T30 millions and authorized to perform banking business of any description, apart from its main transactions, while its dealings were restricted to husbandmen. Subsequent laws have provided it with fresh ways and means, and in 1930 its capital was £T100 millions. Supplementary to the Agricultural Bank with its 281 branch offices are the agricultural credit co-operatives established in 1929.

The first banks to be established with the object of financing and controlling industry were (1) the Turkish Business Bank, and (2) the Industrial and Mining Bank of Turkey.

The Turkish Business Bank (*Türkiye Iş Bankasi*; 1924) was not a State-owned institution, but a privately owned joint-stock company, with headquarters in Ankara and forty-five branch offices. A majority of the original shares were held by Mustafa Kemal, and were bequeathed by him to the People's Party. Although the bank has taken a prominent part in the financing of industry, it confined its affairs, at least in the early stages, to privately owned businesses. Its principal activities were connected with:

(1) The Zonguldak coal-field (p. 213), where modern plants were erected for washing coal and the manufacture of semi-coke.

(2) Sugar. The bank supported, from its inception, the plan to make Turkey self-supporting in sugar (p. 209). In 1935 the four sugar refineries were consolidated into a single business

under State control, and the bank became the leading shareholder in the consortium. Turkey's sugar production reached 88,680 tons in 1940, and was expected soon to reach 100,000 tons, which would make the country entirely self-supporting.

(3) Textiles. The bank purchased and operates a woollen mill in Ankara. It also acquired an interest in the silk-weaving industry (p. 207).

(4) Glass. In 1933 the bank erected a plant for the manufacture of glass, which now supplies a considerable part of the domestic demand (p. 219).

(5) Timber. The bank has organized a lumbering concern on the Black Sea coast. The logs are floated down the Kizil Irmak to the company's saw-mills at Bafra (p. 208).

(6) Mining. The bank possesses important interests in the Ergani copper mine and in the sulphur mines of Keçiborlu (p. 217).

The Industrial and Mining Bank (*Sanayi ve Maden Bankasi*; 1925) was the first of the purely State banks to be organized by the Republic, for the express purpose of financing and administering all the industrial undertakings of the State, of promoting the industrial development of the country, and of performing every class of commercial and financial transaction connected with those industrial establishments.

The capital structure of this bank repays attention; it explains how the Republic was able to capitalize new State banks without crippling the budget. The Government began by paying into the bank, as a working capital, £T1,214,000 in cash. In addition it handed over to the bank a number of State factories, inherited from the Ottoman administration—the Army cloth factory at Fezhane (Istanbul); a cotton mill at Bakirköy (p. 203); textile and carpet works at Hereke (p. 206); a tanning plant and shoe factory at Beykoz (p. 213) which has an output of 750,000 pairs of shoes per annum; ceramic works at Kirşehir and Isparta. The Government also handed over to the bank, in a lump sum, the amounts appropriated in the budget of the Ministry of Commerce for the encouragement of industry. The total of these commercial payments, and the capital value of the enterprises ceded to the bank, constituted its capital.

The Sümer Bank. In 1933 the Industrial and Mining Bank was liquidated and its assets were absorbed into the new Sümer Bank,[1] which now became the principal channel for the financing of the new

[1] i.e. Sumerian Bank. The Turks like to think that they are the descendants of the ancient Sumerians and Hittites. Another of the State banks is called the Eti (i.e. Hittite) Bank.

State undertakings called for by the 'First Five-Year Plan' of 1934 (p. 198).

The law of June 1933, which defined the future operations of the Sümer Bank, established the principle that Turkish industry should be based on raw materials produced, or capable of being produced, within the country. There was no question of establishing artificial industries, based upon imported raw materials; and manufacture for export was not envisaged. The Government's intention was that it should finance and control (1) the enterprises which it took over from the Industrial and Mining Bank, (2) other existing State textile industries, and (3) the industries to be established under the First Five-Year Plan. It was accordingly endowed with eleven factories as well as with shares in ten other industrial enterprises (most of which were inherited from the Industrial and Mining Bank).

The Eti Bank (1935). It was soon found that the textile and other industries controlled by the Sümer Bank offered more than enough scope for its activities. The Government therefore decided to found the Eti Bank for the development, financing, and control of the State mining and electrical properties, with a capital of £T20 millions, largely consisting, like that of the Industrial and Mining Bank and the Sümer Bank, of the transfer of State interests in mines and electric plants. Some mining interests of the Sümer Bank were also transferred.

To assist the bank in its operations, an Institute of Electricity and an Institute of Mining were established. With these the bank works in close co-operation; new mining or electrical proposals are examined by their technicians, and development is based on their reports (p. 111).

The Eti Bank has already several mines, some of which promise well. A rich chrome-deposit discovered at Güleman, near the Ergani copper mine, is being satisfactorily opened (p. 118); a new gold and silver-lead mine is being developed at Keban north-west of Elâziz (p. 122); the ancient silver mines of Gümüşane, Divrik, and Okday are being prospected afresh (p. 124). The bank had also acquired from the *Deutsche Bank und Discontogesellschaft* the majority share-holding in the Ergani copper mine (p. 119).

Most important of all, the bank is in control, on behalf of the State, of all mineral-oil prospecting. After several years of effort, oil was struck west of Siirt, not far from the Iraq frontier, and boring is going on there with satisfactory results (p. 114). The experts of the Institute of Mines believe that the new field will produce sufficient oil to meet the needs of Turkey. The war interrupted progress, because the

machinery which had been ordered from America did not arrive; but negotiations have been started for the acquisition of spare machinery from the Iraq oilfield.

The Maritime Bank (*Deniz Bank*), formed in 1938, had charge of all the State's marine and river transport, the State steamship companies, the harbours of Istanbul, Izmir, and Trabzon, transport on Lake Van, various State shipbuilding yards and dry-docks, the salvage company's lifeboat stations, and the lighthouses of the Republic. It had £T50 millions capital, but was liquidated during 1939, and its affairs taken over by the newly formed Ministry of Communications.

The Fishing Bank, with a capital of £T10 millions, is being organized.

The Municipal Bank (*Belediyeler Bankasi*; 1933) was founded to finance and co-ordinate municipal development, such as town-planning, municipal utilities, drainage, and other public services. The bank has a nominal capital of £T15 millions, derived mainly from compulsory contributions out of the revenues of all the municipalities of Turkey, and from the sale of shares to municipalities which may have funds to invest. It acts as banker to the municipalities, and grants loans to them in accordance with their solvency and with the importance of the work which they may wish to undertake, like the English Local Government Board.

The Real Estate and Orphans' Bank (*Emlâk ve Eytam Bankasi*; 1927). When the Government of the Republic was established it was found that the estates held in trust for various Orphans' Funds were not well administered. It decided therefore to liquidate these funds, and to administer them through a 'Real Estate and Orphans' Bank', which is at once a trust company and a mortgage bank with the functions of a Public Trustee. Half its capital was provided by the Government by a transfer of State properties. By the establishment of this bank the Government was able to apply trust funds and other deposits to mortgages on real estate for the development of housing throughout the country, particularly in the new city of Ankara, where are its headquarters (photo. 51): another example of the policy of devoting many small deposits and reserve funds to finance a large programme of public development. It should be noted that in Turkey, as in all Moslem countries, very large estates have been devoted, in the course of time, to charitable and religious purposes.

The Evkaf Bank, now projected, will exercise similar control and direction over the vast religious and educational endowments (*wakf*). These two banks therefore serve the same purposes as the Charity



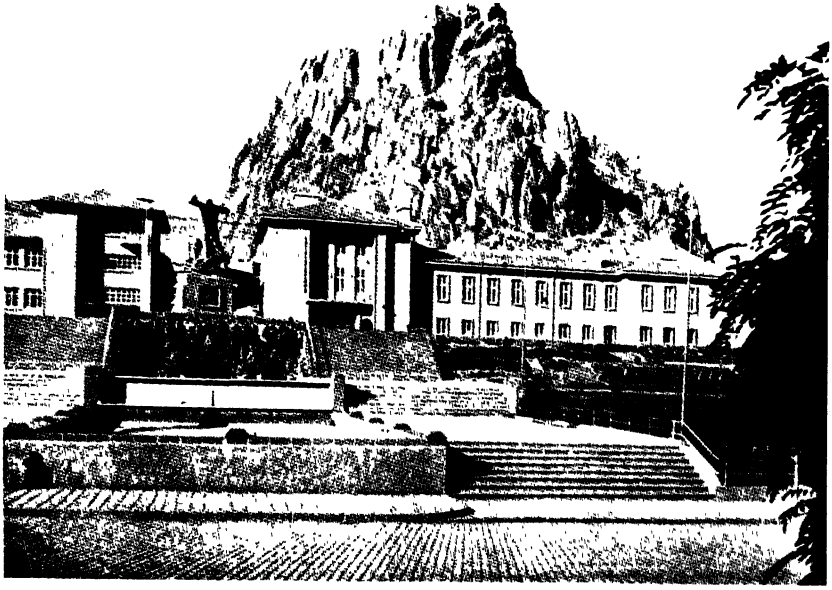
51. *The Real Estate and Orphans' Bank, Ankara*



52. *The Bank of Agriculture, Ankara*



53. *The Commercial College, Ankara*



54. *The Ali Çetinkaya Railway Institute, Afyonkarahisar*

Commission and Ecclesiastical Commission of Great Britain, and as the Board of Agriculture in regard to the estates of universities and colleges.

The Savings Bank of Istanbul (*Istanbul Emniyet Sandiği*) was organized in 1868 by Midhat Pasha after his removal from the Danubian province and appointment as chairman of the Council of State. He had already created a similar institution at Rustchuk. The first premises of Midhat's establishment were in Tarakçi Han, at Mahmutpaşa, the most busy haunt of money-lenders. The bank began without capital, on deposits made by Midhat himself and other leading men, from which it made immediate loans; but the Government provided maintenance and salaries for a few months, and applied the postal revenue to guarantee deposits. The bank engaged also in pawnbroking, discounted salary-vouchers for officials when pay was in arrear, and negotiated transfers by drafts on local agents of the Treasury. After successive panics between 1876 and 1895 the Savings Bank was brought in 1907 under the control of the Agricultural Bank, and was transferred in 1927 to that bank's former premises.

In 1939 it held £T14½ millions of deposits and over £T2 millions in reserve—to which is added the balance of its annual profits.

The People's Bank (*Halk Bankasi*; 1938) was founded to perform functions similar to the old Savings Bank of Istanbul and to issue credits to the artisans of small towns.

National Banks

Name	*Founded*	*Private or State*	*Nominal capital £T*	*Paid-up capital £T in 1939*	*Function*
Agricultural Bank	1888	State	100,000,000	39,098,000	Agriculture.
Business Bank	1924	Private	5,000,000	5,000,000	Private industry; general banking; insurance.
Industrial and Mining Bank	1925	State	..	liquidated	..
Real Estate and Orphans' Bank	1927	State	20,000,000	8,217,841	Mortgages and trusts.
Municipal Bank	1933	State	15,000,000	10,503,173	Town-planning, municipal utilities.
Sümer Bank	1933	State	100,000,000	41,605,586	State textile industries and the Five-Year Plan.
Eti Bank	1935	State	20,000,000	7,052,593	State mining and electrical power.
People's Bank	1938	State	1,200,000	1,200,000	A popular saving bank.
Maritime Bank	1938	State	..	liquidated	Maritime, lake, an river transport; har bour works, docks.
Total capital of Turkish banks (32)			270,115,000	119,991,867	..
Total capital of foreign banks (7)			6,778,647	6,778,647	..

All banks that are incorporated under Turkish law of 1936 and are owned and controlled by Turkish subjects are recognized as 'national' banks; including the establishments in Turkey of the principal foreign banks (p. 177), except the (Imperial) Ottoman Bank, which retains its privileged position till 1952. There are thus about forty 'national' banks, with aggregate nominal capital £T280 millions. There are also private banks, mostly small local concerns, and about forty insurance companies, of which eight are Turkish and four British.

Public Finance

While the problems of national economic development were met by the establishment of departmental banks, operating the Five-Year Plan, the general finances of Turkey were being brought out of chaos into comparative stability.

Retrospect. Under Ottoman rule, extravagance and mismanagement resulted in recurrent deficits, which were met by cumulative loans of foreign capital. Salaries and pensions were in arrear, private indebtedness was aggravated by unscrupulous money-lenders, and revenue diminished as production and trade became disorganized. Between 1850 and the Young Turk Revolution (1908) the Ottoman public debt had risen to 2,560 million French francs (£102·4 millions sterling), and by 1914 to twice that amount. By the Treaty of Lausanne, £T107,518,671 of this debt were assigned to Turkey, and the remainder to the provinces lost during the War. In 1933 this debt was stabilized by agreement at nearly £T80 millions.

Under the Republic no further general loans have been raised abroad. Revenue has begun to exceed expenditure, and both are increasing. Pension and other standing charges are relatively less, and production is being relieved of excessive and ill-distributed taxes. Much of the revenue is from indirect taxation, especially from State monopolies of sugar, salt, tobacco, spirits, explosives, matches, playing-cards, and opium; the last-named is regulated in accord with Yugoslavia, the other principal producer. Capital expenditure on public works and extension of industrial plant is financed (as above) by the new special banks.

The currency (p. 187), first organized in 1841, but debased and disorganized, has been stabilized, and a gold reserve is being formed. The floating debt is being redeemed on a long-term plan. Foreign trade (p. 188) is being effected mainly (85 per cent. in 1937) by clearing-house exchanges.

The Central Bank of the Turkish Republic (*Merkez Bankasi*). Even

the Young Turk administration did nothing to modify the dependence of Turkish finances on the Imperial Ottoman Bank (p. 177). But in 1917, under German influence, the Ottoman Government created by charter a central bank, designed to take its place. This 'Central Bank' was reconstituted under the Republic by the law of 11 June 1930, and began operations on 3 October 1931. It is a joint-stock company with a concession for thirty years, renewable during the last five years of this period, and it is the sole bank of issue in Turkey. It fixes the rate of discount, regulates the money market and circulation, transacts business on behalf of the Treasury, and takes steps to stabilize the Turkish currency (*below*). It has taken charge of the Treasury-note circulation (£T158,748,563 authorized 30 December 1926 and issued concurrently with the notes of the (Imperial) Ottoman Bank, through that bank), the Government making an initial payment in gold and international securities, and paying annual instalments of its liability to the bank. The bank may replace these Treasury notes by its own issue; it handles the Treasury's international payments, foreign exchange, and gold assets, and is the sole fiscal agent of the Government, and depository of its public funds. Inland transfers are made through the numerous local branches of the Agricultural Bank. The shares of the Central Bank are in four categories, held respectively by the State, the new State banks, other concession-holding companies, and Turkish corporations and individuals. Each class of shareholder is represented on the board of directors, but the higher executive officers are nominated by the Government. The initial capital of the Central Bank is £T15 millions, 70 per cent. paid up.

The Ottoman Bank retains the right to a limited issue of its own notes, repayable in gold before its concession expires.

Currency

Ottoman currency had fallen into disorder. On an old unit, the piastre (*kuruş*), divided into 40 *paras*, was based a silver currency of which the *mecidiye* piece of 20 piastres passed at various rates according to locality and usage. There were also base-metal pieces (*metallik*) of incommensurable piastre-values; and for larger amounts the paper currency of the Imperial Ottoman Bank.

On 8 April 1916 gold export was prohibited, and a gold standard was adopted with the piastre as unit. This has been maintained. The 'Turkish pound' (*lira*) is divided into 100 piastres, weighs 7·216 grammes, and contains 6·6147 grammes of fine gold. The piastre is

divided (as of old) into 40 paras. There are gold coins of £T 5, 2½, 1, ½, ¼; silver coins of 50, 25, 10, and 5 piastres; nickel coins of 1 piastre, 20 paras, and 10 paras. Silver coins are legal tender up to 300 piastres, and nickel coins up to 50 piastres. The coins in circulation at the end of 1941 amounted to £T29,454,000.

There are two kinds of paper currency: (*a*) notes of the Ottoman Bank (p. 177), which has had right of issue since 1863; limited to £T279,069, and in circulation on 31 December 1937, only £T203,462; (*b*) notes of the Central Bank (p. 187), including notes issued by the State during the War of 1914–18 and taken over by the bank since 3 October 1931, and those issued subsequently by the bank and covered by gold and foreign exchange. There are notes of £T1,000, 500, 100, 50, 10, 5, and 1. The total note-circulation at the end of 1941 was £T407,492,000.

The currency is depreciated, the Turkish 100-piastre note (= £T 1 = 1 *lira*) being worth about one-sixth of the gold coin of the same denomination. At the beginning of 1929 the Government stabilized the exchange at about 1,030 piastres to the £1 sterling; in 1931, at 12·06 French francs to the *lira*; and later at the franc-sterling-dollar rate. In 1938 the £T tended to rise in terms of sterling, and varied between 630 piastres in February and 587 in December. The average rate over the whole year was 616 piastres to the £ sterling.

The metric system of weights and measures came into force on 1 January 1934; but many of the old weights and measures—about 100 in all—remain in popular use. European numerals were made obligatory from 1 June 1929. Weights and measures are periodically inspected, and a factory has been established for the production of balances and other instruments of precision.

Foreign Trade and Exchange

Turkey has great and varied natural resources, but in the past had inadequate outlet for its products, which include both foodstuffs and raw materials for industry. It has consequently suffered severely from the protective policy of other States. Moreover, by its own creation of industries to supply its primary needs, it has consumed at home a large part of its ill-developed output.

The commercial clauses of the Lausanne Treaty (I, p. 323) and the Ottoman Debt Settlement (p. 186) imposed heavy burdens on Turkey. But the Government of the Republic was unwilling to negotiate further loans abroad, or to alienate sources of revenue to guarantee payments of interest. Under the Lausanne Treaty,

Turkey had to admit, for five years from 1923, raw materials and manufactured goods from the Allies at the Ottoman rates of duty (1916), which were low; and the total volume of this foreign trade was high, especially with Great Britain. But Turkish exports were insufficient to pay for these goods as well as the debt charges; there was a dearth of foreign exchange, and a financial crisis in 1925.

On 16 November 1931 the importation of foreign goods was regulated in favour of those States which took much Turkish produce; and in 1932 this system was made more flexible by 'compensations' (*takas*) granted to certain commercial houses and Turkish banks for the periodic exchange of Turkish with foreign commodities. The result was to dispose of Turkey's accumulated stocks of tobacco and other produce. In 1933 'compensations' were replaced by 'clearing-house' agreements as follows:

(*a*) Where the trade balance was adverse (from Germany and Switzerland) the deficit is paid in Turkish produce.
(*b*) Where the account is balanced, there are commercial agreements for exchange of commodities at par value.
(*c*) Where the trade balance is positive (Greece) a part of the Turkish exports may be paid for in part by 'compensations'.

Countries with 'clearing-house' agreements have preferential terms for their industrial commodities; they supply £T86·2 million imports a year. Countries with free exchange supply £T21·9 millions; 'compensations' account for £T1·4 millions; and other procedures £T4·8 millions.

These complicated arrangements are the special concern of the Ministry of National Economy.

On the expiry of the Lausanne Treaty, all commercial treaties were denounced; in 1933 the Ottoman Debt Settlement of 1928 was revised (p. 186); national industrialization began with the First Five-Year Plan (p. 198) and with a new Central Office for Foreign Trade Services (*Türkofis*), whose functions include commercial information and facilities for tourist traffic. Economic equilibrium was attained in 1930, and later years began to show favourable balances, rising to £T7 millions in 1935, and £T25 millions in 1936. But the general economic crisis in 1931 had hit Turkey hard. On the founding of the Central Bank (pp. 186–7) the foreign banks ceased to 'support' the Turkish pound; and in 1938 the balance of trade became adverse again. The Anglo-Turkish agreements of 1930, 1935, and 1936 (with a new clearing-house in London) did something to help matters; but

in 1938 British exports to Turkey were deliberately restricted, and as a result of the new industrial expansion in Turkey, they diminished from 12 per cent. of Turkey's foreign trade in 1926–7 to 6 per cent. in 1936–7. Especially notable were the fall in cotton and woollen goods and in sugar, and the rise in cotton and linen thread for the new industries, in raw iron and steel, and in machinery. Meanwhile in 1937 Germany, paying higher prices than were offered by the British market, took 36·53 per cent. of Turkey's exports, and from its subsidized industries provided 42·08 per cent. of the imports. In 1938, under the new agreement, imports from Britain rose from 6 to 11 per cent., but Turkish exports to Britain sank from 7·1 to 3·4 per cent. mainly because the British markets were still overstocked and prices lower than on the Continent; the corresponding German amounts being both about 50 per cent. Since much of this German trade was seaborne, it was stopped by the Allied blockade, the clearing-house arrangement was not renewed, and German trade fell from 50 per cent. to 2 per cent. But Great Britain and France were not at once able to supply the needs of Turkish traders, though in 1940 they took 28 per cent., with large contracts for Turkish fruits. In October 1940, however, a comprehensive Anglo-Turkish Treaty of Mutual Assistance provided, through a joint economic office, both for Turkish armaments (£T25 millions) and for extensive purchase of Turkish produce, including the whole output of Turkish chrome ore for steel alloy. Early in 1940 Italy had about 30 per cent. of Turkish trade—probably including some transit trade from Germany—and the United States were supplying much that Great Britain and France could no longer spare. Rapid expansion of trade was urgent for Turkey's economic development, and with prosperity, Turkey's own needs were growing. The effect has been to restore a favourable balance of about £T42 millions in 1940 (fig. 55, p. 230).

The State Budget

Before the *Tanzimat* reforms, the revenues of the Ottoman Empire were the personal income of the Sultan; and even after the establishment of a Treasury and of a Financial Council, the Palace continued to squander some 15 per cent. of the revenue, while as much as 50 per cent. went to pay the interest on an ever-increasing debt. Provincial governors, ill supplied by the Treasury, used illegal means to raise funds for their own administrations. The Young Turks restricted Palace expenditure, and gave to the Chamber of Deputies legal control of public finance, but continued to borrow abroad; and in

1913 receipts (31,900,000 gold francs) and expenditure (34,000,000 g. fr.) left a deficit of 2,100,000 g. fr. During the War of 1914–18, when expenditure rose to 35,000,000 g. fr. while revenue sank to 23,000,000 g. fr., the deficit was met by an internal loan of £T15,000,000, and by the issue of paper notes, which were rapidly depreciated.

The Republic was therefore faced in 1924–5 with a revenue of £T (paper) 129 millions, expenditure of £T (paper) 140 millions, and

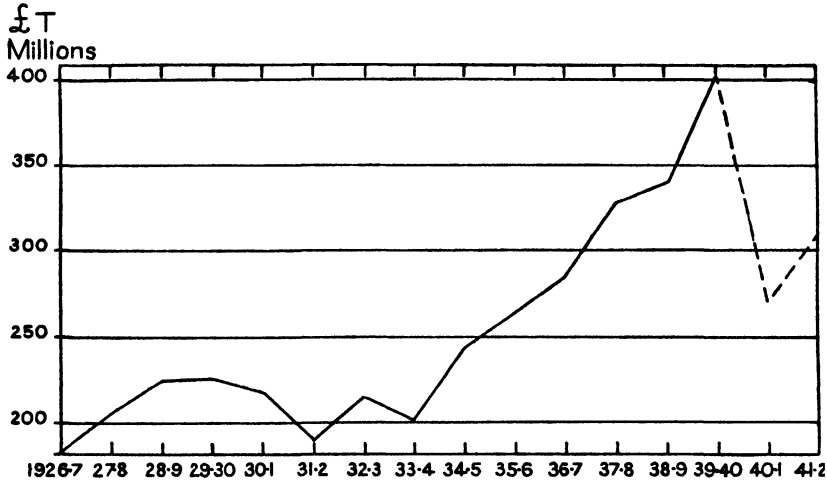


FIG. 50. *Turkish Revenue, 1926–7 to 1941–2*

a deficit of £T (paper) 11 millions. The remedies were obvious: reform of the system of collection, fresh direct and indirect taxes, and new State monopolies; the old ones being already devoted under agreement to the service of the Ottoman Debt. For the financial year 1926–7, though expenditure had risen to £T190,104,000, revenue at £T190,159,000 left only a small surplus. The principal economies were the disappearance of Palace expenditure and the relative reduction of debt-charges to about 5 per cent. of the total expenditure; the Government also resumed direct administration of the Ottoman Debt. The larger expenditures, after debt-charges and national defence, were now due to public works (as much as £T26 millions in 1931–2), public health, education, and other measures of internal betterment. The old system of tithes on products of the soil was replaced by taxes on sales and other business transactions, and by estate and succession duties, supplemented by a heavier but better

adjusted customs tariff, by new monopolies, and by improved receipts from State enterprises; most of these, however, appeared no longer in the national budget but in the accounts of the new State Banks, while other considerable charges were shared between the central Treasury and the provincial administrations.

Since the financial year 1926–7 the budget has been balanced, and even when the development caused by the First Five-Year Plan began to increase expenditure, revenue appears to have kept pace with the rise (fig. 50).

Public Finance: Budget Estimates

(in thousands of Turkish pounds)

REVENUE

	1940–1	*1936–7*	*1931–2*
Direct Taxes on income and property . . 12 per cent. below £T 5,000 30 per cent. above £T 5,000	46,205	36,800	40,622
Indirect Taxes on sales, transactions, customs .	99,250	83,980	82,141
Monopolies	49,680	36,610	39,118
State lands and buildings	2,030	3,061	4,085
State-operated organizations[1] . . .	971	469	8,985
Govt. shares in railway companies, &c. . .	1,870	1,056	1,047
Miscellaneous receipts	11,275	10,388	10,207
Extraordinary revenues[2]	57,200	40,400	500
	268,481	212,764	186,705

EXPENDITURE

	1940–1	*1936–7*	*1931–2*
National Assembly, Council, &c. . . .	5,663	2,901	2,423
Customs and Monopolies	5,544	5,101	4,226
Registry of Title Deeds	1,669	1,249	1,111
Religious Affairs	673	608	640
Public Debt	67,337	45,728	26,450
Ministry of Finance	21,821	17,715	12,262
Ministries of Interior, Security, &c. . .	25,093	18,170	17,059
Ministry of Foreign Affairs . . .	3,455	3,196	3,102
Ministry of Public Health	8,179	5,458	3,721
Ministry of Justice	9,266	8,799	7,378
Ministry of Education[3]	17,796	10,271	6,594
Ministries of Economy,[1] Commerce, Communications	4,469	4,181	13,583
Ministry of Public Works[4]	9,048	14,671	26,406
Ministry of National Defence . . .	77,095	63,051	58,919
Ministry of Agriculture	6,931	8,041	..
Miscellaneous	4,437	3,616	2,708
	268,476	212,756	186,582

For notes 1–4 see opposite page.

Provincial and Municipal Finance

	1942	*1930*	*1925*
Provincial Revenues	..	49,933	22,035
Municipal Revenues	18,000	..	..

	1942	*1935*	*1925*
Provincial Expenditures	..	40,133	17,605
Municipal Expenditures	17,000	..	..

The Public Debt

	1939 £T	*1936* £T
Consolidated Debt:		
Turkish currency	182,312,974	178,230,474
Foreign currency	149,448,504	173,115,899
	331,761,478	351,346,373
Floating Debt:		
Turkish currency	213,277,019	79,452,312
Foreign currency	74,347,184	53,092,497
	287,624,203	132,544,809
Grand total	619,385,681	483,891,182

[1] Many State enterprises have been transferred to the special banks (p. 180); hence the fall of £T8 millions on both sides of the account under this heading between 1931–2 and 1936–7.

[2] Extraordinary revenue has been raised by surtaxes—Crisis Tax and Equilibrium Tax—to avoid a deficit and recourse to loans.

[3] Much expenditure on education falls on provinces and municipalities. The totals are (1938–9) 29,785; (1934–5) 22,879; (1929–30) 22,533 (thousands £T).

[4] Much expenditure on construction and upkeep of roads falls on provinces.

INDUSTRIES

General Organization and Control

Turkey, an agricultural country, had before 1923 very few industries—a number of small textile mills, carpet-weaving and rug-making (p. 207), pottery manufacture, a few coal-mines near the Black Sea; some of the older, such as faïence-work, had almost disappeared (photos. 55, 56). There were only about 17,000 industrial workers, mostly Greeks or Armenians, and many enterprises, including those of public utility—gas, water, and even harbour-works —were controlled by foreigners. An early aim of the Republic was therefore to free industry of foreign capital and to reorganize it on a national basis. The financial measures that were taken and the establishment of a new banking system have been outlined above. It remains to describe the use made by the State of the country's raw materials —wool, cotton, timber, coal, iron, and other minerals —and of her labour and other resources.

As part of the broad scheme of reconstruction the State planned:

(*a*) to locate factories in central and eastern Turkey when practicable, partly for security reasons, partly to settle and develop those regions, and partly to avoid industrial concentrations in the west, which was best suited to cultivation;

(*b*) to reorganize and develop communications, especially by rail;

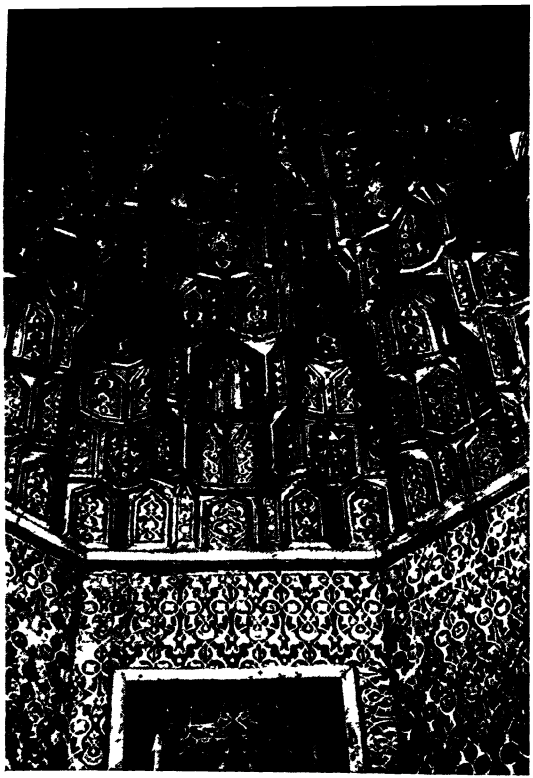
(*c*) to import essential machinery, tools, and other equipment;

(*d*) to train, at first under foreign experts, a skilled body of industrial managers and operatives; and

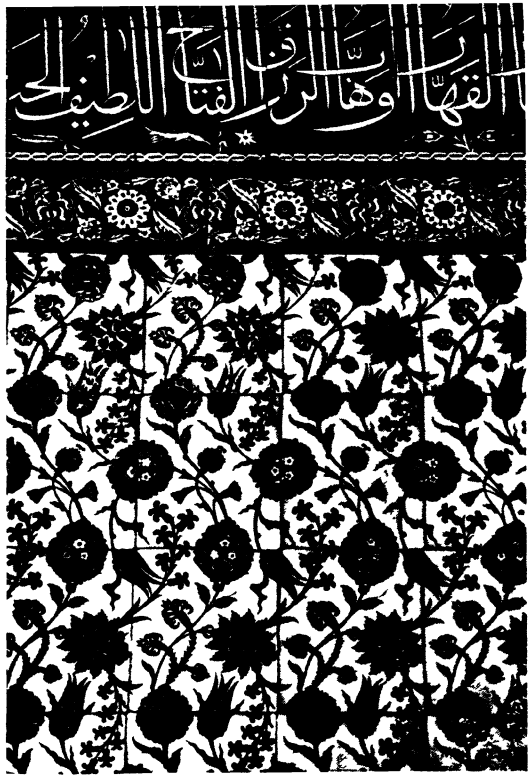
(*e*) to develop subsidiary industries to use by-products and to prevent waste, e.g. the chemical works at Izmit, subsidiary to the cellulose factory, and the cement factory at Karabük to use up blast-furnace slag.

State control and supervision has led to long-term planning and co-operation between agriculture, mining, and industry; but, within the system, private enterprise is encouraged, and the old local industries of spinning, weaving, and pottery have been assisted, modernized, and expanded.[1] Home production is now protected by

[1] 'Although considering private enterprise as a basic idea it is one of our main principles to interest the State actively where general and vital interests of the State are in question, especially in the economic field, in order to lead the nation and the country to prosperity in as short a time as possible. . . . The interest of the State in economic matters is to be an actual builder, as well as to encourage private enterprises, and also to regulate and control work that is being done.' (Party Programme II. d.)



55 *Dome of the Green Mosque, Bursa*



56. *Blue Faiences at Bursa*

tariffs and other restrictions on imported manufactures, but the balance of trade is not affected, since certain specialized goods must still be imported and the surplus agricultural products are easily disposed of abroad. Manufactured goods are almost all for the home market, and there is no intention, ambition, or opportunity to compete abroad with industrial countries. It is said that the value of industrial production is now about half that of industrial imports.

The chief imports and exports in 1940 were as follows:

Imports	*Exports*
Mineral oils and coal	Tobacco
Machinery and locomotives	Cotton
Iron and steel manufactures	Hazel-nuts
Cotton yarns and piece-goods	Mohair and wool
Copper and copper goods	Hides and skins
Paper and leather	Olive oil
Chemicals	Raisins
Tea, coffee, and cocoa	Opium
Woollen yarns	Chrome

The increasing demand for raw materials is met partly by increased home production and partly by the import of raw or half-manufactured material. Both imports and exports of manufactured goods have decreased in recent years, although, with a rising standard of living, the demand for most goods is increasing.

The principal means of organizing and developing industry have been (1) the purchase of foreign concessions for public services; (2) the labour laws, and other laws of 1927, 1933, 1936; (3) the Five-Year Plan of 1934 and its sequels (p. 198); and (4) the simultaneous organization of banks and transport.

Purchase of Foreign Concessions

Public services have mostly been established or taken over by the Government or by the local authorities. In 1939 the only public services still in foreign hands were the gas and electricity of Ankara (German), gas of Istanbul and Kadiköy (Belgian), Beyoğlu gas (French), trams and electricity of Izmir (Belgian), water-supply of Izmir (Belgian), and the electricity supply of Edirne, Tekirdağ, Bursa, Balikesir, Gaziantep, Mersin (all Italian), and of Adana (German). In addition, the narrow-gauge railway (18 miles) between Palamut and Ilica was owned by the Société des Mines de Balya Karaydin, but is since reported to have been purchased by the State.

The Labour Laws

The Law of 1927 included (1) State provision of land and buildings for factories, free or on easy terms, with rights to purchase such land from private owners if necessary; (2) relief of certain taxes on factories; (3) reduction of customs duties on industrial materials. The industries which benefited most were mining and manufacturing textiles, food, agricultural and wood products. The laws of 1933 and 1936 regulated working hours and other labour conditions.

Except in Istanbul, Izmir, and a few other cities, there was until recently no industrial element in the population, still less any distinct working-class. Of the whole working population 82 per cent. are engaged in cultivation and pastoral pursuits (p. 18), though probably not more than 5 per cent. of the whole area is cultivated. It has been the desire of the People's Party, and therefore, hitherto, of the Government, to establish on a nationalist basis a classless society, and so to avoid the social problems of the industrialized West, and create skilled and contented workers of all kinds, without need for trade unions or for strikes, which were regarded as both 'class' and 'international' devices.

As the new factories were almost all State-owned, it was possible, and indeed necessary, for the Government to lead in this matter. Opposition to State control has been slight; though there were strikes between 1927 and 1929, organized resistance to new measures is difficult, because of the absence of trade unions or similar institutions. Furthermore, workers appreciate the advantages of expanding industries, for the State provides for their health, comfort, and education. The newest factories, such as the cotton mill at Kayseri, are 'garden cities' with spacious avenues, lawns, gardens, sports grounds, schools, shops, and cheap comfortable living-quarters, while the workshops themselves are light, airy, and hygienically equipped. The older private factories are not so well organized, but much is being done by example, competition, and State inspection.

The Labour Law of 1936, based on direct experience of State factories, governs all industrial concerns employing more than ten men; like smaller workshops, agriculture was excluded. Government factories, having from the first a high standard of social services, have the advantage over older and smaller private firms.

Labour conditions are safeguarded by law and by democratic representation, which virtually replaces trade-union procedure. In 1924 a 60-hour week was imposed, but in 1936 this was revised. In that

year a 10-chapter law covered contract rules, hygiene, working conditions, strikes, inspection, social service, complaints, and penalties. An 8-hour day and a 48-hour week were made legal, and 'overtime', which was only to be worked with the employee's consent, was not to exceed 3 hours a day, nor 90 working days a year, and was to be paid at the rate of 25–50 per cent. above the normal rate. In addition, underground and night work was forbidden for women and children.

Wages are paid by negotiation between the management and a committee selected by the workers, with provision for arbitration. In the larger industrial communities the 'People's House' and the local branch of the People's Party have informal influence. Expert opinion favours the extension of the code to smaller businesses. But the main safeguard for industrial workers is the difficulty of getting labour at all, industry being for most people supplementary to work on the land, a temporary source of capital with which to buy a farm or build a house. It is therefore necessary to make industry attractive.

Wages vary from place to place, according to the local supply of labour. Rates of pay have recently tended to rise. Whereas the cost of living based on 100 for 1914 fell from 1,381 in 1929 to 957 in 1935, it rose again to 1,082 in 1940. It would appear that those who enter organized industries are better paid; but there is still much poverty, especially among the country people. During the war the Government under emergency powers has suspended many provisions of the Labour Code.

Seasonal and temporary labour is frequent, some peasants coming in to work in the factories during slack farming months and returning to the country for harvest, while others, seeking capital, work in factories for 1–3 years and then return to their farms. Permanent and skilled labour is therefore hard to obtain, and foreigners have had to be employed, until the State can train its own experts and technicians. In almost every industrial concern, Turkish craftsmen are being trained and will later succeed the foreign expert. In 1938 there were 9 Trade Schools (one in Ankara, one in Istanbul, and the rest in other large towns) which children of 13 or over can attend as an alternative to the Middle School. There are also new technical institutes, and apprenticeship courses at several new textile and leather factories. Zonguldak is a training centre for miners, and here convicts of good behaviour are sometimes employed. The experiment is said to be highly successful; the pit-managers obtain more or less permanent labour, as the men are often serving long sentences, and

the convicts are said to be good workers, earning money which is banked until their release.

The Long-Term Plans

The alternative to exploitation of Turkish resources with foreign capital was intensive and far-sighted concentration of national wealth, and especially of small savings, on the specific development of industries for which Turkey had the raw materials and the labour—coal, coke, iron and steel, copper, sulphur and other chemicals; textiles, paper products, cellulose, glass, and pottery for the home market; and the 'three white articles', flour, sugar, and cotton. Special attention was paid to self-sufficiency, and justifiable help given to failing private concerns. Foreign capital and skill were not excluded, but were admitted only for strictly specific objects, and with the aim of making Turkey independent of such aids, by increased production and native craftsmanship.

The First Five-Year Plan

In 1933 the Prime Minister of Turkey made a State visit to Moscow, where he negotiated an important financial agreement with the Soviet Government (p. 179). This agreement, which was finally signed on 21 January 1934, provided for a credit of 8 million gold dollars, increased the following year to 10 millions, for the equipment, by Russian engineers and technicians, of three cotton-spinning and weaving mills. The Soviet Government agreed to prepare plans for the plant and to deliver and install the machinery within four years. They also undertook to train Turkish workmen in Russia in the technique of spinning and weaving. The Turkish Government agreed to repay credit by instalments spread over twenty years. These instalments were to be paid by the Sümer Bank to the Central Bank of Turkey for account of the Soviet Government, and would be available for the purchase of Turkish produce for shipment to Russia. The method of fixing the prices of the deliveries to be made by both parties was indicated in a separate protocol. A similar credit agreement, repayable in the same way, but over eight years instead of twenty, was concluded in June 1936 with Messrs. H. A. Brassert & Co., of London, and the British Export Credits Guarantee Department. It provided for the erection of iron and steel works at Karabük (p. 215). The conclusion of these two credit agreements enabled the Government of the Republic to carry through the First Five-Year Industrialization Plan. Without these credits the financial problem

would have been beyond its capacity; for the total capital required was about £T45 millions.

The execution of the First Five-Year Plan was entrusted to the Sümer Bank in 1934. After thorough expert examination of the requirements of the home market, the available resources in raw materials and labour, and their location, the plan was formulated and published. It covered five branches of industry:

1. Textiles (cotton, wool, hemp, and jute).
2. Mineral products (iron, steel, semi-coke, coal derivatives, copper, and sulphur).
3. Wood-pulp (paper, cardboard, and rayon).
4. Ceramics (glass, bottles, and china).
5. Chemicals (chloride of lime, caustic soda, sulphuric acid, and superphosphates).

(1) *Textiles.* (*a*) Cotton. To bring the output of yarn and cotton cloth in Turkey to about 80 per cent. of the country's normal consumption, four new factories and one extension were planned (p. 203). The machinery for two of these, at Kayseri and Nazilli, was supplied and erected by Russian engineers and technicians under the contract with the U.S.S.R.

(*b*) Wool. A mill at Bursa was planned at a cost of £T1,650,000 to produce 1,000 tons per annum of worsted yarns from local wools, which are of finer quality than those of the Anatolian plateau. The foundations were laid in 1935 and the mill is in operation.

(*c*) Hemp and Jute. Mills were to be erected at Kastamonu and near Izmir for the manufacture of tarpaulins, sacks, rope, &c. (No information is obtainable.)

(2) *Minerals.* (*a*) Iron and Steel. The plan provided for plant at Karabük to produce iron and steel, and coal derivatives (p. 215).

(*b*) Copper. The exploitation of the Ergani deposit (p. 119) was first ceded by the Republic to a limited company in which the State had part interest. In 1933 the Government's share in the mine was handed over to the Sümer Bank. The plan provided for an increase in annual production of ore from 10,000 tons during the first two years to 15,000 tons the third year and 24,000 tons the fourth year.

(*c*) Sulphur. Turkey's principal sulphur mines are at Keçiborlu in the vilâyet of Isparta, where the deposit is estimated at 1 to 1½ million tons containing 40 per cent. of sulphur. The plan provided £T318,000 to produce 5,000 tons of sulphur per annum. The plant was completed in April 1935.

(3) *Wood-pulp.* (*a*) Pulp. A factory at Izmit was built at a cost of £T625,000, and now produces 17,000 tons annually.

(*b*) Paper and Cardboard. A paper-mill at Izmit, built at a cost of £T2,190,000, was opened in November 1936, and has now an output of 12,000 tons per annum, working at full capacity. A second factory at Izmit was included in the plan, and was under construction in 1940.

(*c*) Rayon. A factory at Gemlik, costing £T490,000, was begun in 1935 and is now in operation with an annual capacity of 300 tons of yarn. A cellulose factory at Izmit was designed, and is now in operation.

(4) *Ceramics.* (*a*) Glass and Glass Bottles. Research in various localities showed that Turkey possessed a deposit of sand at Çatalca suitable for the manufacture of glass, and hardly inferior in quality to the glass sand of Germany and Czechoslovakia. It was therefore decided to erect at a cost of £T1,245,000 two glass-works at Paşabağçe, on the Bosporus, one, completed in 1935, for the manufacture of glass bottles and a second for the manufacture of window glass.

(*b*) China-ware. Kütahya has long been famed for its ceramics; nevertheless, practically the whole of the country's requirements were imported from abroad. £T500,000 were allocated for a factory begun in 1936 at Kütahya, to produce 750 tons of china-ware a year—about half the normal consumption.

(5) *Chemicals.* Plant for the manufacture of (*a*) sulphuric acid, (*b*) superphosphates, (*c*) caustic soda, (*d*) chloride of lime, at a cost of £T2,350,000. In July 1940 plans had been completed for sulphuric acid and superphosphates plant at Karabük and deliveries were to begin in 1941.

In addition to the sums allocated for the construction and equipment of plant, a sum of £T500,000 was set aside to cover the cost of sending young men abroad to study the technique of industrial production. Until the outbreak of war many were studying in technical colleges of France, Britain, Germany, Belgium, and U.S.A. Most of them have since been recalled.

With the exception of some unimportant sections, the Five-Year Plan has been completed, and the effect on industrial output has been remarkable. The total output of Turkey's industries has increased from £T32 millions in 1927 to 277 millions in 1938 and 331 millions in 1940.

No doubt some of these enterprises have been at times badly

managed, and losses have been incurred; but under State ownership and quasi-monopoly there are ways of making good temporary losses until the enterprise has had time to reorganize itself. The principle of liquidity, which should preclude a bank from investing depositors' money in industries from which it cannot be withdrawn at short notice, has undoubtedly been set aside; but the banks which have financed this economic development are State institutions, financing State operations. In the event of a 'run' on any one of them, the resources of the State would, presumably, be available. Orthodox bankers will shake their heads at these methods and especially at the immobilization of the savings of small investors. But Turkey to-day possesses a considerable number of well-equipped factories, producing essential goods, and is developing mines and maritime transport. Many of the cities are supplied with water, gas, and electricity. Most of this has been accomplished in a matter of fifteen years out of internal resources. If this technique, or a technique similar to it, had not been adopted, it is safe to say that the extraordinary development of Turkish economy could never have taken place.

The Second Five-Year Plan

The success of the First Five-Year Plan convinced the Government of the Republic that it was working on right lines. It decided, therefore, in 1936 to embark upon a second, to develop mining, harbours, electrification, iron and steel, oil, fisheries, refrigeration, tin-plate, chemicals, and the mercantile marine. The estimated cost was £T100 millions. Further schemes included the 1937 *Three-Year Plan* for developing minerals and the 1938 *Four-Year Plan* for developing ports and communications, new industries and factories. A new *Five-Year Plan* is intended to incorporate the 1938 Plan with further development.

The preliminary work on the second and third plans was well in hand when the political outlook compelled Turkey to turn from economic development to preparedness for war. At least one major enterprise, however, has been undertaken: the electric power station at Çatalağzi, to supply power to the Ereğli coal-field. The contract was signed in 1940 between Metropolitan Vickers Electric Co. and the Eti Bank; it provides for the erection of power plant of 60,000 kW.

Progress

In spite of difficulties a good deal of progress has been made in

the building, equipment, and production of factories. There has been a general tendency for the smaller, uneconomic workshops, especially those lacking power, to be given up, expanded, or absorbed into larger concerns. Hence the number of employees increases more rapidly in proportion to the number of factories. As the Turkish definition of 'factory' varies, sometimes including every industrial establishment, regardless of size, number of employees, and equipment, statistics are deceptive. In 1939 there were said to be 1,144 industrial establishments, of which nearly 1,000 were built between 1923 and 1930; 15 large factories were completed between 1934 and 1939, and at least 6 were under construction in 1939. Altogether, industrial establishments in 1939 possessed equipment worth £T103,677,000, buildings worth £T63,979,000, used £T124,557,000 of Turkish and £T23,819,000 of imported raw material, and produced £T331,075,000 of goods.

Power. Mechanical power is increasingly used. In 1929 under 4 per cent. of the total number of factories were said to use mechanical power, but by 1940, 94 per cent. of the important factories had power installed. The factories still without power are generally very small establishments, often textile mills with hand-looms. For electricity and gas, *see* pp. 219 ff.

The increasing value of factory equipment is shown by the following figures:

	Value in 1,000 £T	
Year	*Equipment*	*Buildings*
1932	55,627	61,656
1937	82,084	52,650
1939	103,677	63,979

Detailed figures are given for the main groups of industries in 1939, of which the agricultural, textile, and metallurgical are the most important.

Industrial groups	*Establish-ments*	*Equipment (1,000 £T)*	*Horse-power*		*Production (1,000 £T)*
			Total	*Electric*	
Agricultural	468	27,786	65,736	11,319	177,851
Textile	249	27,805	53,100	11,384	65,014
Timber	53	8,240	14,111	884	5,396
Metallurgical	41	4,506	20,189	3,185	9,625
Mining	37	13,367	117,804	6,741	27,569
Paper	37	4,441	13,278	1,557	6,728
Chemicals	37	313	537	272	4,027
Building	28	4,276	15,010	9,847	6,529
Others	194	12,943	53,506	5,332	28,336
Total	1,144	103,677	353,271	50,521	331,075

The following figures show the increase in industrial raw materials used between 1932 and 1939:

Value of Raw Material consumed (in 1,000 £T)

	1932		1939	
	Turkish	*Imported*	*Turkish*	*Imported*
Agricultural	40,034	4,174	77,400	6,570
Textile	7,632	4,102	25,557	8,623
Metallurgical	272	2,418	1,488	3,169
Paper	9	892	1,141	2,030
Chemicals	2,717	1,178	2,790	328
Wood	2,813	275	1,894	614
Mining	45	14	1,023	10
Building	297	150	438	94
Others	6,440	693	12,826	2,381
Total	60,259	13,896	124,557	23,819
	74,155		148,376	

Textiles

The development of the textile industries has been the most successful feature of the 1934 Five-Year Plan. More factories, machinery, and skilled workers are still needed, as textile yarn and piece-goods still formed a large percentage of Turkish imports by value in 1940, but by 1941 there were 5 State cotton mills, 7 woollen mills, and 1 for artificial silk, besides many small local mills dealing with cotton, wool, mohair, silk, or camel-hair. The total number of textile workers in 1935 (84,000) was expected to double when all the State factories then planned or in building were working. The location of the more important factories is shown on fig. 51.

Cotton. The chief cotton-growing regions in Turkey are in the west and south (pp. 146–7); factories have been built in these regions and also on the plateau and in the east. Besides the five State mills run by the Sümer Bank (p. 199) at Kayseri, Malatya, Ereğli, Nazilli, and Bakirköy, there are nine private mills (Istanbul, Izmir, Denizli, Adana, and elsewhere). One of those at Adana is said to possess about 10,000 spindles and to have been taken over by the State through the Agricultural Bank. Another factory at Adana has 36 ginneries, employs about 2,000 workers, and uses about 2,000 electric horse-power. There are also State spinning-mills at Isparta and Kirşehir, but it is not known whether they produce cotton or wool. A new factory is planned at Erzurum to be supplied with cotton grown in the Iğdir plain.

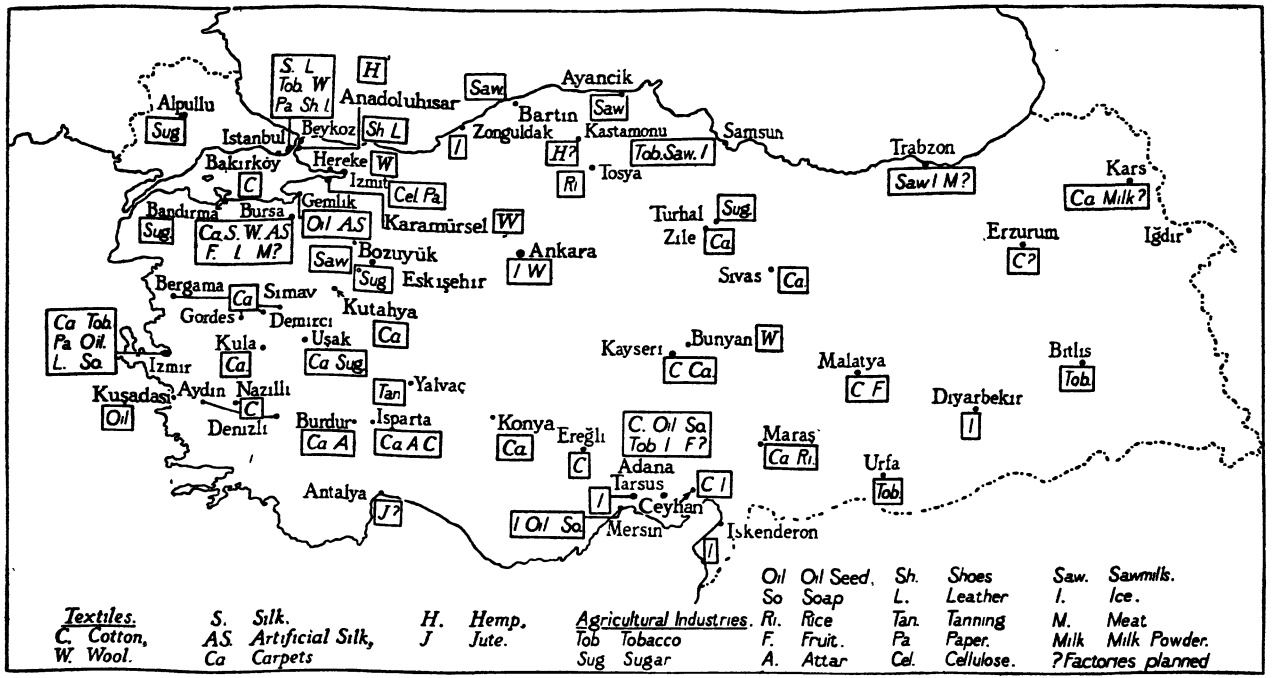


FIG. 51. *Distribution of Agricultural and Textile Industries*

Details of the five chief State Cotton Mills (1940)

		Value of buildings (1,000 £T)	*Spindles*	*Looms*	*Workers*	*Raw cotton consumed (tons)*	*1940 production*
Bakirköy	Aug. 1934	3,200	8,930	302	1,265	1,975	7,584,000 yds. cloth
Nazilli	Aug. 1935 Oct. 1937	7,250	22,790	768	2,616	2,970	1,915,000 lb. yarn 14,350,000 yds. cloth
Ereğli	Nov. 1934 Sept. 1937	3,770	18,000	329	1,899	1,545	106,600 lb. yarn 4,423,000 yds. cloth
Kayseri	May 1934 Sept. 1935	8,620	30,900	1,008	2,723	4,625	488,400 lb. yarn 22,970,000 yds. cloth
Malatya	May 1937 July 1939	3,500	26,000	432	3,459	2,200	3,547,000 lb. yarn 5,860,000 yds. cloth
	Total	26,340	106,620	2,839	11,962	13,315	6,057,000 lb. yarn 55,187,000 yds. cloth

Principal Private Cotton Mills

	Name	*Spindles*	*Looms*
Istanbul . . .	Yedikule mills	13,860	..
Izmir . . .	Izmir Pamuk Imalati	19,000	610
	Şark Sanayi	25,000	250
Adana . . .	Milli Mensucat	21,000	300
	Çukurova	12,000	130
Tarsus . . .	Rasim Bey	16,000	120
Mersin . . .	Iş Bank (formerly Şaşati)	10,000	..
	Total	116,860	1,410

The total number of spindles rose from about 70,000 in 1931 to over 223,000 in 1940. The factory at Kayseri, the largest in the Middle East, works continuously. The buildings are well designed, light and airy. Baths, playing-fields, lecture and recreation rooms are provided for the workpeople, and it is a model installation of its kind (photos. 57, 58). The Ereğli, Nazilli, and Bakirköy factories are almost as good.

About half the cotton produced goes to State factories. Turkish cotton is short-staple, but improved varieties are being introduced. Altogether Turkey produced about 270,000 bales or 77,000 tons of raw cotton in 1940. It is hoped that the amount exported (about 11,000 tons in 1940) will soon be absorbed by Turkish factories, even when production of raw cotton increases. Already the demand for certain classes of cotton manufactures, chiefly *cabot*, a coarse cloth worn by the peasants, is supplied by the State; and with irrigation development,

better seed, and more factories, further decrease in imports is to be expected. The improving situation is reflected in the following figures:

	1924	*1932*	*1935*	*1939*	*1940*
Exported raw cotton (tons) . . .	12,519	9,142	14,964	9,154	11,473
Imported yarn (tons) .	3,894	3,487	2,891	4,250	856
Imported cloth and piece-goods (tons) .	22,248	13,673	10,318	8,759	3,599

It is interesting to note that early in 1942 the Government announced plans for extending the cottage weaving industry, so that the peasant population can supply its entire needs of cloth. A survey carried out by the Ministry of National Economy showed that in 1942 there were 143,700 hand-looms in the country, 45,700 of which produced cloth for sale and the rest for home use. Production from these looms is about 90 million yards of cloth annually, and the quality is superior to that of the State mills. Large quantities of yarn are to be imported, chiefly from India; the number of hand-looms is to be doubled, and travelling instructors are being sent to the villages to teach the use of the new looms.

Wool. Owing to the number of sheep in Turkey (26 millions in 1940), wool is plentiful, and generally of good quality; the best comes from the west and north of the plateau (pp. 168–9). About 33,000 tons were produced in 1940.

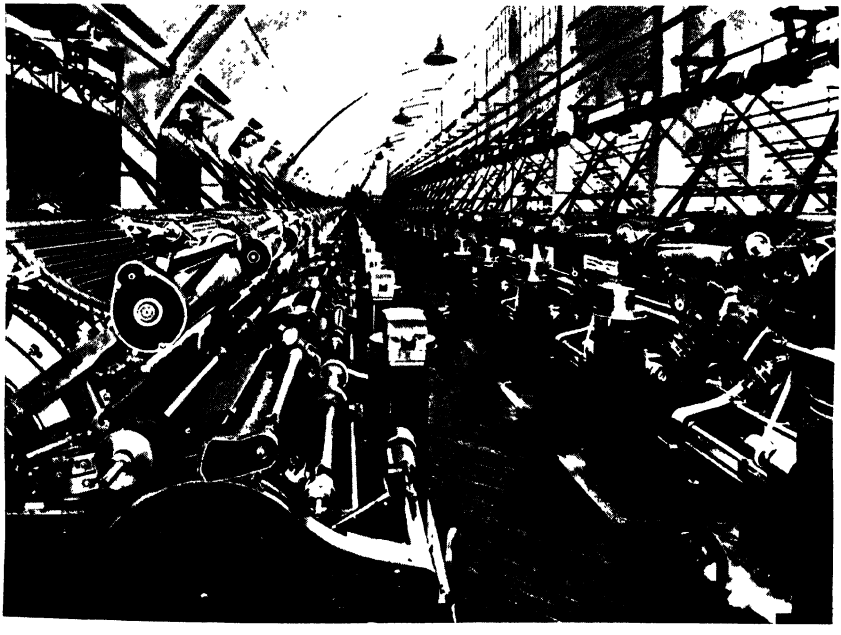
Chief Woollen Mills

Place	*Work*	*Foundation*
Fezhane (Istanbul) .	Spinning and weaving (army cloth)	Sümer Bank.
Hereke (near Izmit).	Spinning and weaving	Sümer Bank.
Karamürsel . .	Spinning and weaving	Private.
Bursa . . .	Spinning	Sümer Bank.
Ankara . . .	Weaving	Iş Bank.
Bünyan . .	Weaving	Sümer Bank (part).
Izmir . . .	Weaving	British.
Kula . . .	Blankets, carpets	Private.
Uşak . . .	Blankets, carpets	Private.
Eyüp (Istanbul) .	Weaving	Iş Bank (part).

The mill at Bursa contains equipment worth nearly £T4½ millions, including 16,180 simple and 7,040 double spindles, employs over 2,000 employees, and uses about 900 tons of merino and 2,500 tons of ordinary wool annually.

The industry uses several million Turkish pounds worth of imported wool and yarn annually. Imports of raw wool and yarn

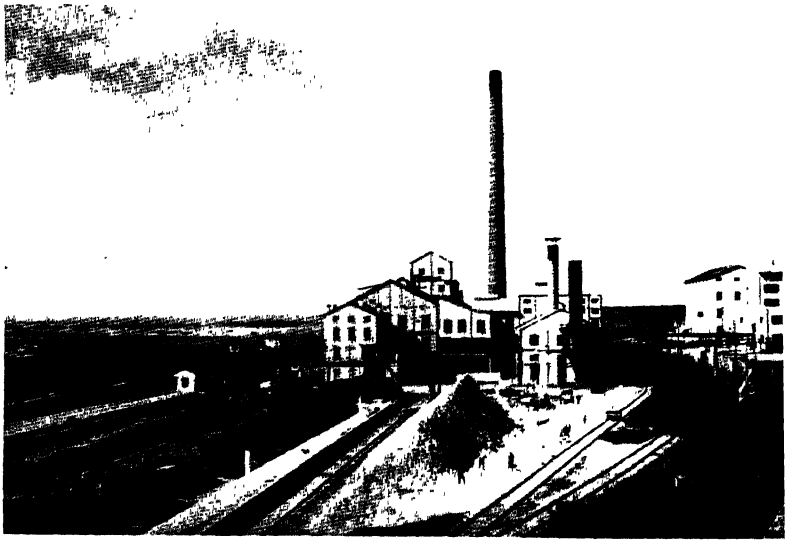




57, 58. *The Cotton Mills at Kayseri*



59. *Sugar Refinery at Uşak*



60. *Sugar Refinery at Alpullu*

totalled about £T3 millions in 1938, but in 1940 it was said that 80 per cent. of the wool consumed was Turkish.[1] Wool is still exported for manufacture abroad, since Turkish factories cannot yet consume it all, but these exports of wool, and imports of woollen piece-goods, are gradually decreasing.

In 1938, 2,500 tons of ordinary yarn and some fine merino yarns were produced; weaving factories consumed about 1,500 tons of fine yarn (650 tons from Bursa mills and 850 tons from abroad) as well as the 2,500 tons of ordinary yarn produced in Turkey from about 3,500 tons of local wool and 3,000 tons of woollen rags. In this year altogether about 5½ million yards of cloth were made.

Fewer carpets and rugs are made than formerly. The chief centres are Bursa, Uşak, Kula, Gördes, Demirci, Bergama, Simav, Kütahya, Burdur, Isparta, Konya, Kayseri, Maraş, Zile, Sivas, and Kars. Recent annual production figures are as follows:

Gördes	100,500 sq. yds.
Isparta	77,700
Simav	10,000
Uşak	4,500
Burdur	1,000
Kula	440
Bergama	380

For a note on Turkish Rugs and Carpets *see* p. 233.

Mohair, the long, silky hair of Angora goats, is produced mainly on the western plateau. Of the annual total of about 7,000 tons more than half is usually exported (4,551 tons out of 7,721 in 1940).

Silk. Sericulture is an old Turkish industry, the silkworms thriving on the numerous mulberry trees of the north and west (p. 151), but it is unimportant as compared with cotton and woollen manufacture. Bursa is the chief centre, Istanbul a minor one. In 1936 there were said to be about 107 'factories' in Turkey as against 7 in 1923; about 2,000–3,000 workers were employed (mostly women), and machines used 450 electric horse-power. Seventy-seven of the 'factories' are in Bursa. Lack of equipment and organization has restricted development, but the following statistics suggest some progress:

	1924	*1933*	*1936*	*1938*
Families engaged in sericulture	..	37,640	49,340	55,770
Production of fresh cocoons (tons)	..	1,889	2,135	2,348
Exports of raw silk, dry cocoons, and silk waste (tons)	150	121	132	233
Exports of raw silk, dry cocoons, and silk waste (£T1,000)	1,465	63	161	986

[1] Imports of merino wool fell from about 2,000 tons in 1939 to about 900 tons in 1940. Scottish wool is valued by Turkish firms.

Artificial Silk is now produced at Gemlik and Bursa. Formerly about 200 tons of artificial silk were imported yearly, but now, in order to manufacture her own, Turkey makes cellulose (the basis of rayon) at a new factory in Izmit, where a factory for the caustic soda and sulphuric acid used in the industry is under construction. The artificial silk factory at Gemlik employs 310 people and has a scheduled capacity of 300 tons; production only began in 1939, and output was only 160 tons in 1940.

Linen. Flax is grown in many plains of the north and west (p. 151); over 10,000 tons were said to have been produced in 1940, the yearly average originally planned. At present flax is exported, but a factory is projected at a cost of £T1·7 million, to use about 6,000 tons a year.

Hemp. About 9,000 tons a year are grown, mainly in the north, west, and south-west (p. 150); this quantity could be increased. A factory is to be built at Kastamonu to consume 6,000 tons a year, for the manufacture of sacks, ropes, matting, and sails. A modern rope factory has been built by a Leeds firm at Anadoluhisar, north of Üsküdar, to make ropes up to 18 inches in circumference. Productive capacity is thought to be about 35 tons a week, including twine, cord, and ropes of all kinds.

Jute is grown in the plains near Izmir and Antalya, and a factory at Antalya is contemplated.

Other Agricultural Industries

In addition to textiles, timber and food industries have received State assistance in order to make the fullest use of Turkey's great agricultural resources, and to ensure essential food supplies, especially flour and sugar. The location of the more important is shown on fig. 51.

Timber, Paper, and Cellulose

Timber, especially pine and fir, is plentiful in the mountainous regions (p. 166) and there are many local saw-mills, particularly in the north, e.g. at Trabzon, Samsun, Ayancik, Bartin, and Bozüyük. Exploitation presents many difficulties, but the timber available almost balances home needs, and improvements in forestry organization and in transport (many rich forests are at present inaccessible) should enable supply to keep pace with demand, even when the State expands the timber industry. Some saw-mills now use hydro-electric power (about 9,000 h.p. annually, from 400 motors), often obtained

from local streams, but most of the mills are on a small scale. In 1935 there were 410 small private saw-mills, as against 55 important ones; the former cut about 170,000 cubic yards of timber a year, the latter about 882,900 cubic yards. The two largest and most modern mills are at Ayancik and Bozüyük, producing sawn timber, boxes, railway sleepers, and shavings for packing. The Ayancik mill is run by the Zingal company, which owns 74,130 acres of local forest and uses up-to-date methods of extraction and transport. In 1937 the capacity of the mill per 8-hour day was about 523 cubic yards of soft-wood and 78 cubic yards of hard-wood. The capacity of the Bozüyük mill was rather less. Another saw-mill at Bafra, owned by the Iş Bank, uses logs floated down the Kizil Irmak. Timber is used for furniture, vehicles, boats, buildings, charcoal, and paper.

Paper-mills at Izmit and at Istanbul use Turkish wood-pulp. The former was opened in 1936, and produced over 10,000 tons of paper and cardboard in 1940. Kaolin from Silifke and Kütahya, alum from Şebinkarahisar, and resin from Bursa are also used in the industry, which employs electric and steam power. A second paper-mill under construction at Izmit in 1940 was designed to use straw, wood, and rag-pulp, and to produce cigarette-paper and other fine papers. Formerly 4 per cent. of Turkish imports by value were paper and allied products, but this figure had been reduced to 2·7 per cent. in 1939, and when the new factories are in full production the whole of Turkey's normal paper requirements should be satisfied.

A cellulose factory has also recently been built at Izmit, using Turkish wood-pulp and straw to produce cellulose for the artificial silk factory at Gemlik. A chemical factory is to be built nearby to work in conjunction with the cellulose works.

Sugar

Sugar-beet is grown in many parts of western and northern Turkey (p. 148). Four factories, employing over 5,000 people, already manufacture sugar, at Alpullu (1926), Uşak (1926), Eskişehir (1933), and Turhal (1934), another was being built at Bursa in 1939, and two others were proposed in eastern Turkey (photos. 59, 60). Output from these factories should soon meet demands, although consumption has increased in recent years (61,000 tons in 1935; 120,000 tons in 1942). Imports totalled 22,400 tons in 1936, 12,000 tons in 1937, and 62,000 tons in 1938, when drought caused a poor crop in Turkey. The 1940 crop was about 90,000 tons, and imports were reduced to 9,615 tons.

Sugar Production (tons)

Year	Alpullu		Uşak		Eskişehir		Turhal		Total	
	Sugar	Molasses and pulp	Sugar	Molasses and pulp	Sugar	Molasses and pulp	Sugar	Molasses and pulp	Sugar	Molasses and pulp
1926	459	141	114	55	..	..	..	..	573	196
1930	8,144	2,854	4,930	1,436	..	..	..	..	13,074	4,290
1937	10,046	3,485	6,228	2,113	20,361	4,874	14,940	4,073	51,575	14,545
1938	8,023	3,801	6,089	1,359	13,008	3,206	15,407	4,344	42,527	12,710
1939	24,803	9,976	12,921	3,526	26,921	6,866	30,547	8,051	95,192	28,419
1940	11,808	3,611	18,109	4,522	32,457	8,447	26,295	6,614	88,669	23,194

Cereals

Flour. Small flour-mills are found in almost every town; in 1937 there were said to be fifty-two important ones, and small stocks of flour are reserved each year. There are also biscuit and confectionery factories in some of the large towns. Barley is used for both flour and beer (p. 137). From 1931 until 1940 there appear to have been no imports of wheat—indeed some wheat has been exported—so that adequate flour is assured.

Rice-husking mills are subsidized by the State in Bursa, Tosya, and Maraş, but production figures are not available.

Tobacco

The tobacco industry occupies many people in Turkey, although most of the tobacco grown is exported for blending purposes. Local preparation of tobacco is common, but there are modern factories for tobacco and cigarettes at Istanbul (Golden Horn), Izmir, Adana, Samsun, Urfa, and Bitlis (photos. 61, 62). Employees were said to number 10,000 in 1937, i.e. more than double the number in 1925.

Canning and Preserving

The canning of fruit, vegetables, milk, meat, and fish, all of which are plentiful in Turkey, is being undertaken.

Bursa and Malatya have fruit and vegetable canning factories, and a third is reported at Adana. About twenty stations or factories were planned in 1938 for drying apples, pears, and apricots. Jam and other preserves made on a small scale everywhere will ultimately be produced on a large scale in factories. Tomato and orange juice, cider, and other extracts are already manufactured.

There is a milk-powder and cheese factory at Kars and another is

planned at Çorlu. The factory at Kars was working by 1937, but was expected to close each winter. Large meat factories have been proposed at Trabzon, Bursa, and Mersin for the manufacture of preserved and chilled meat, *salami*, bone-meal, glue, and other by-products of offal. The factory slaughter-houses in Trabzon and Mersin together are expected to deal with 2,000 sheep and 500 cattle daily. The abattoir at Adana deals annually with about 40,000 sheep, 7,000 goats, and 3,000 cattle and buffaloes. Many slaughter-houses in other towns have small factories attached for the manufacture of by-products.

Fish is preserved by salting, smoking, and canning. There are (1942) small factories for salting, canning, and making fish-meal at Kartal and Söke, and others are proposed at Trabzon, Istanbul, Gelibolu, and Izmir. *Caviare* and *botargo* (p. 176) are also made along the Black Sea and Aegean coasts respectively; a caviare factory at Sinop is under consideration.

A cold-storage warehouse, with a carbonic acid refrigerating-plant, is to be built at Samsun to hold 50,000 cases of eggs.

Wines and Spirits

Wine. Vines for wine covered about 30,000 acres in 1937, mainly in the coastlands of the Aegean and Sea of Marmara, including European Turkey. The wines, of fairly good quality but few varieties, are generally fairly dry, red or white. An excellent sweet white wine, raisin-flavoured 'muscatel' (Greek: *moschato*; Turk: *muskatelle*), is made from the sweet sultanina, razaki, and muscat grapes; Turkish wine output has increased rapidly; bonuses are given to large wine-grape producers, and foreign wine is severely taxed. New factories have been built at Izmir and Manisa, run on modern lines with electrically-driven presses. A wine-cellar at Tekirdağ produces about 9 per cent. of all Turkey's wine. Chief marketing centres are Kula, Gördes, Bergama, Konya, Lâdik (near Merzifon), Silivri, Tekirdağ, Büyük Çekmece, Istanbul, and Üsküp, near Kirklareli. Bozca (Tenedos) island also produces wine.

Liqueurs. About 500 hectolitres (11,000 gallons) a year are produced from European Turkey, Bozca, and the Aegean. *Pekmez* or grape syrup, somewhat similar to quince-jelly, is made where wine is uncommon. Various other grape preserves are common locally.

Raki, a strong grape-spirit, is also made; in 1939 about 1,030,000 gallons came from private factories and 694,000 from State factories.

All spirit production is a State monopoly. About 1,042,000 gallons

of commercial alcohol were produced in 1939, besides 629,800 gallons of *souma* (100 per cent. alcohol).

Raw Alcohol Production (tons) at State Sugar-factories

	1930	1935	1937	1939	1940
Alpullu . . .	607	616	2,003	..	..
Uşak . . .	..	588	545	..	..
Eskişehir . .	..	..	..	1,647	8,447

Vegetable Oils

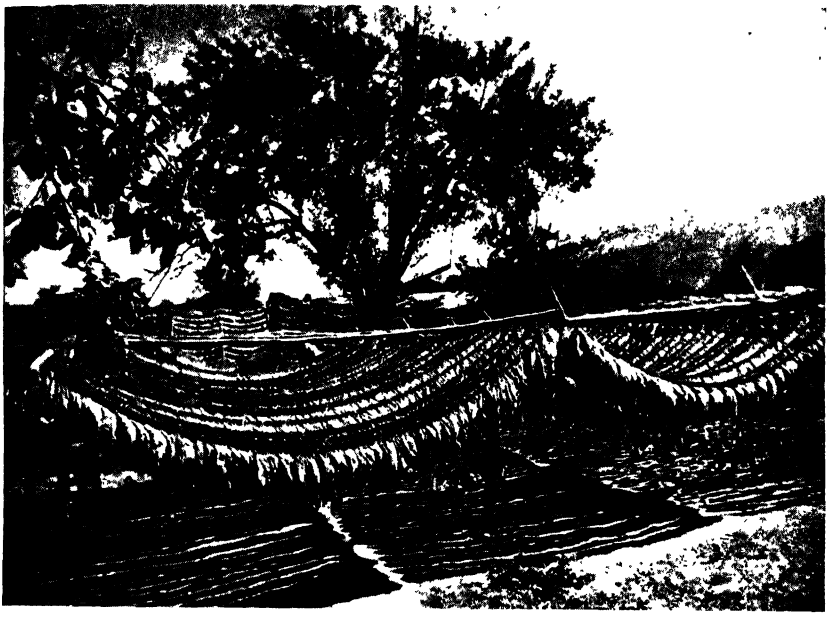
There are crushing factories for the production of oil from olives and various oil-seeds in the towns listed below; there may be other small local plants. A plan to erect a factory at Izmir, for the extraction of cotton-seed oil and manufacture of glycerine, was reported in October 1942.

Olive oil.	Kuşadasi (modern).
	Izmir (modern).
	Izmir 'Yağ Fabrika' at Ayatriada (cattle-cake from waste).
	Gemlik (presses).
	Mersin (presses).
Cotton-seed.	Adana (large factory for oil, oil-cake, and soap-waste).
	Mersin (2 plants).
Sesame seed.	Ayatriada (Izmir) (cattle-cake from sesame and cotton-seed; pure sesame cake is unpalatable).
Hemp-seed.	Adana (cotton-seed factory).
Linseed.	Adana (cotton-seed factory can use linseed).
Sunflower-seed.	Ayatriada (cattle-cake factory).

Soap factories are often associated with the oil-extracting plants, as, for instance, at Adana, Mersin, and Izmir (Bayrakli). The Gilodo oil and soap factory at Adana, employing about 150 workers, produced 1,786 tons of oil, 144 tons of soap, and 5,770 tons of oil-cake in 1940. The Turan factory at Bayrakli is nominally Turkish but uses British capital and English caustic soda; it has its own electricity plant of 875 kW.

Attar of Roses

About 200 lb. of attar of roses are produced annually, for perfumery and for flavouring confectionery. New plant at Isparta, built in 1935 under the Five-Year Plan, uses half a million lb. of rose leaves yearly and smaller quantities are distilled in Burdur, Atabey, and Keçiborlu, besides private stills elsewhere. It takes about 3 tons of petals to make 2½ lb. of attar of roses.



61. *Tobacco drying*



62. *Tobacco manufacture at Izmir*



63. *Leather and Shoe Factory, Beykoz, Bosporus*



64. *Semi-coke works at Zonguldak*

Leather

Hides are plentiful in Turkey, and tannin is obtained from the acorns of the ubiquitous valonia oak; the leather industry is underdeveloped, however, and about 7,000 tons of hides and skins, which could be supplied at home, are imported annually from India, Syria, Palestine, and Egypt. There is a large footwear factory at Beykoz (photo. 63), and smaller leather factories at Istanbul, Izmir, and other large towns. The 1940 aim in production was:

650,000 pairs of military boots and shoes
110,000 „ „ civilian „ „ „
1,125 tons of leather soles

The chief tannin factory is at Yalvaç, but tannin and 'valex' (a powder-dye made from valonia acorns) are also made in other western towns.

Ice

Ice, for cold storage during the hot summer months, is made at numerous towns, Trabzon, Samsun, Zonguldak, Istanbul, Bursa, Izmir, Mersin, Tarsus, Adana, Ceyhan, Iskenderon, Ankara, Diyarbekir, and elsewhere. The abattoir ice-plant at Adana has modern equipment and produced over 120 tons of ice in 1939. Cold storage is also available at Haydarpaşa, Bursa, Izmir, Adana, Iskenderon, and Ankara.

Heavy Industries

These have been greatly developed under the Five-Year Plan of 1934 and subsequent plans. Mineral deposits have been surveyed, exploitation has begun, essential machinery has been imported, and communications are being improved to deal with transport demands. The chief centres of heavy industries are shown on fig. 52.

Coal, Coke, and Lignite (*see pp.* 111–14)

Coking-ovens were opened at Zonguldak in 1935 to use about 100,000 tons of coal annually and produce coke for the Karabük furnaces, besides many by-products. Further coking-ovens opened at Karabük in 1939 produced in the next six months 62,000 tons of coke and over 5,000 tons of by-products, such as coke-dust, pitch, benzol, and naphthaline, besides bricks and cement from slag. This production of coal-derivatives was entrusted under the Five-Year Plan to the Business Bank, which was already interested in the

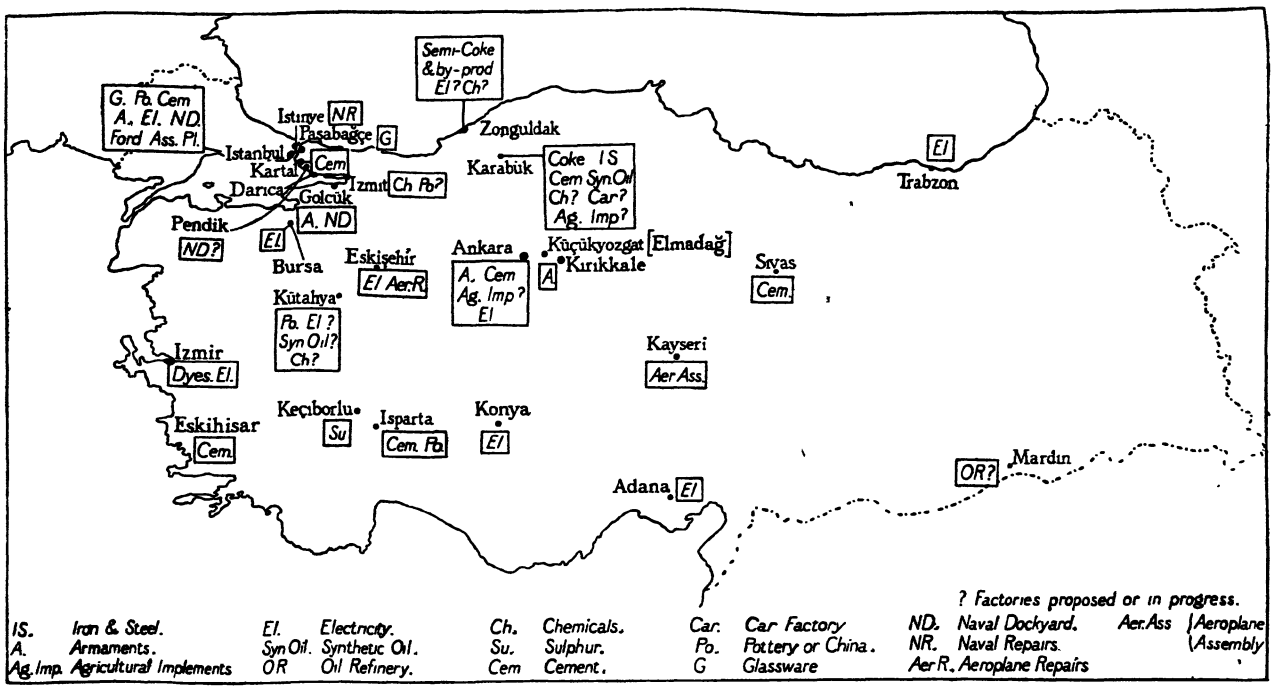


FIG. 52. *Distribution of Heavy and Miscellaneous Industries*

Zonguldak coal-field. From Zonguldak 60,000 tons of semi-coke and 24,000 tons of briquettes were produced in 1940 (photos. 64, 65). No coal-tar is distilled. Gas-works at Istanbul, Izmir, and Ankara produce coke, coal-tar, benzol, and other by-products (p. 225). Turkish lignite is now being used for factories, railways, and domestic purposes.

Iron and Steel (*see pp.* 115–16)

The only works in Turkey are at Karabük, near the Zonguldak coal basin but about 600 miles by rail from the chief iron-mines at Divrik (Divriği), which were not discovered until after the Karabük plant was built. The British firm of Brasserts supplied this plant and undertook to operate it and train Turkish personnel for two years, although the Sümer Bank owns the works. The first part of the works were opened in April 1937 and a further part in September 1939. Their total value was over £T31 millions, and about 2,500 workers are employed. The 200,000 tons of iron ore produced annually at Divrik are sufficient for the present demands of the furnaces, but Brasserts favour the exploitation of ore in the Çam Dağ, north-east of Adapazari. There are 2 blast furnaces and 4 open-hearth furnaces, altogether producing about 80,000 tons of steel castings annually. There are also rolling-mills, capable of producing about 150,000 tons of steel sections and plates, as well as forges and foundries making steel rails and ties, and a new plant is under construction to manufacture iron pipes up to 24 inches diameter. In 1941 Karabük supplied a large part of Turkey's demand for rails, iron bars, girders, plate, and wire. Details of production and capacity in 1940 were as follows:

Plant	*Raw material*	*Potential yearly capacity*
2 blast furnaces	110,000 tons ore	220,000 tons pig-iron
4 open-hearth furnaces	270,000 tons coal	150,000 ,, steel ingots
1 pipe factory		230,000 ,, coke
1 iron foundry		70,000 ,, slag
40 coking-ovens		12,000 ,, crude tar
		4,000 ,, ammon.-sulphate
		1,095,000 gall. benzol

There is also a well-equipped repair shop, and a sintering plant and more chemical works (p. 217) are contemplated.

Turkish pig-iron was in increasing demand in 1939, and 81,000 tons were produced in 1940. The figures of imported iron and steel show a significant decrease in recent years, only in part due to the outbreak of war (241,700 in 1938; 174,900 in 1939; 39,900 in 1940).

It is hoped that Karabük will soon supply some of the growing demand for agricultural machinery, most of which is at present imported from America. A factory for agricultural machinery is also being built at Ankara. Besides the Karabük works, there are iron foundries at Zeytinburnu (Istanbul) and in most of the large towns of the west and north, which use imported iron to manufacture small agricultural implements, tools, kitchen utensils, beds, boxes, small arms, &c., and to repair cars, bicycles, and other machines.

Copper, bronze, and silver goods are made locally, an aluminium factory is planned, and also a factory to make internal-combustion engines, but, apart from the iron and steel industry, Turkish metallurgy is as yet negligible.

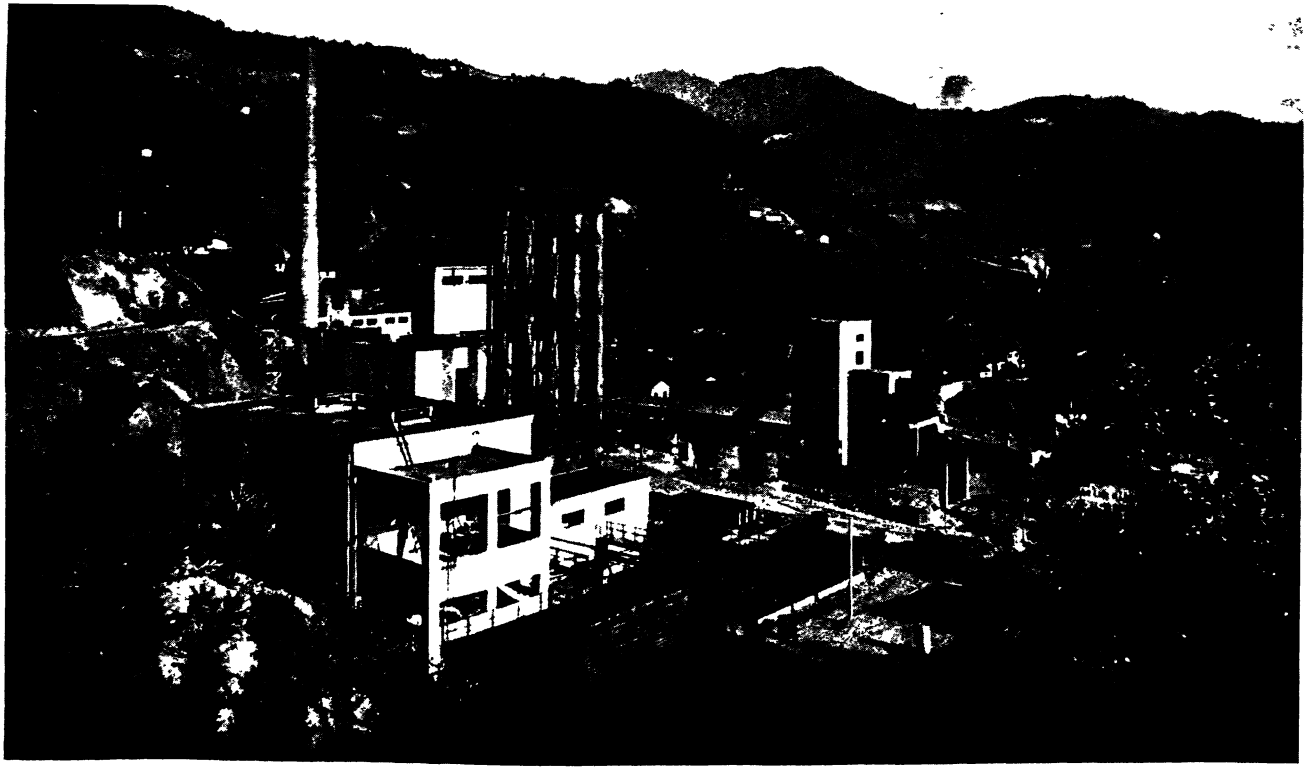
Armaments

Land armaments are produced under both State and private control. The chief centres are at Elmadağ (Küçük Yozgat), Kirikkale, Ankara, Bakirköy, and the Golden Horn. In addition to the manufacture of guns, explosives, and ammunition, there are subsidiary chemical, metallurgical, and electric plants at Elmadağ, Kirikkale, and Bakirköy. Naval armaments are produced on a small scale at Gölcük.

Engineering and Shipbuilding

These industries are still relatively unimportant in Turkey, and most plant, machinery, specialized instruments, mechanical vehicles, rolling-stock, locomotives, and aircraft engines have to be imported. There is a Ford Assembly Plant at Istanbul, capable of an output of 8,000 cars a year from imported parts. This is so far the only attempt at a car industry, although the State is planning a car factory, probably at Karabük, and is training the necessary technicians in Ankara. Only 550 vehicles were sold from Istanbul in 1939 and 122 in the first half of 1940, but owing to the high cost of replacements, new purchases are usually preferred to large repairs, and imports of mechanical vehicles are said to be generally increasing. Recent import figures are:

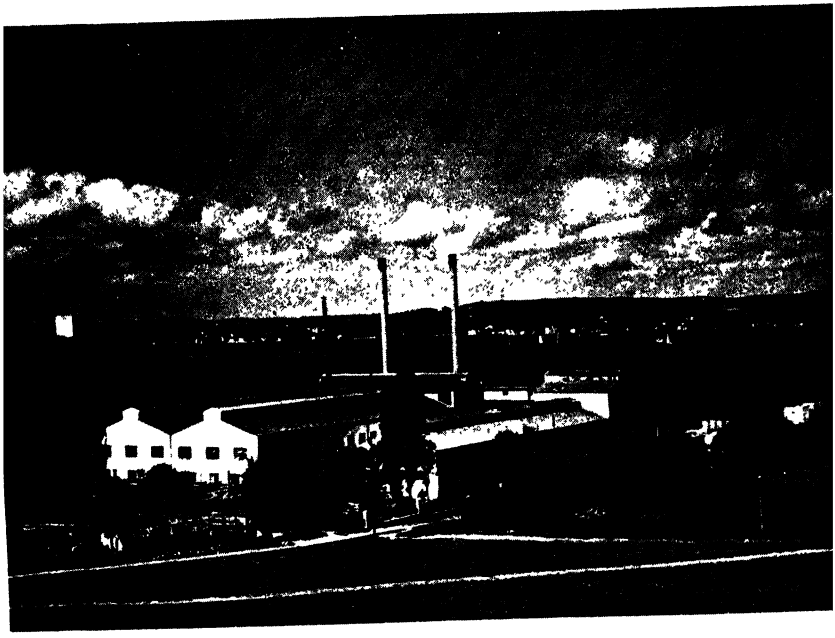
	1938	*1939*
Passenger cars	1,036	1,043
Buses and ambulances	52	124
Lorries and vans	132	83
Street-cleaning and similar vehicles	129	123
Total	1,349	1,373



65. *Semi-coke works at Zonguldak*



66. *Cement works at Kartal*



67. *Glass works at Paşabağçe, Istanbul*

Aircraft and their parts are not manufactured in Turkey. There is an assembly plant at Kayseri, employing about 1,000 men and building fighter and commercial aircraft from imported engines and other parts. There is also a repair shop for wooden parts at Eskişehir, but foreign workmen have to be employed for skilled work.

There are railway repair shops at some of the larger stations; the most important are at Sivas and Eskişehir (p. 259).

Shipbuilding is limited, and all large ships are built abroad. The naval dockyard on the Golden Horn has recently been re-equipped to undertake major repairs and to build submarines and small craft. There are repair yards at Istinye (on the Bosporus) and a floating-dock for ships of 2,000 (one report says 6,000) tons, while Gölcük has a floating-dock for ships up to 25,000 tons, besides repair yards and workshops. A contract for extending the harbour and shipbuilding yards at Gölcük is under examination by British interests. Plans were approved in 1940 for a large shipbuilding and repair yard at Pendik (near Izmit) and construction began in 1942.

Miscellaneous Industries

Chemicals

The Turkish chemical industry is in its infancy, and many chemicals have to be imported. Expansion is planned, and the following factories have been or are being built:

1. A sulphur factory at Keçiborlu (where there are large sulphur deposits) was opened in October 1934, added to in April 1935, and may have been further extended. About 300 workers are employed. In 1940 about 3,400 tons of pure sulphur were produced, but in 1942 only 2,000 tons. The full capacity is nearly 5,000 tons or several thousand tons less than Turkey's requirements. The sulphur is used for explosives in arsenals, and as a fertilizer and insecticide in vine and sugar-beet cultivation.

2. Factories for making chlorine (capacity, 2,000 tons a year) and sulphuric acid (14,000 tons) are under construction at Izmit, and others for caustic soda (2,200 tons) and superphosphates (3,000 tons) are planned. Completion of these factories is delayed indefinitely by the war because essential machinery cannot be imported.

3. Plans for a factory for superphosphates, nitric acid, and sulphuric acid at Karabük, to cost £T400,000, were completed in 1940. A coke lime-kiln belonging to the steel works already produces about 20 tons of lime a day.

4. A sulphuric acid factory is being built at Zonguldak. Sulphuric and nitric acid are made at Elmadağ, and nitric acid at Kirikkale and Bakirköy.

5. Toluol is manufactured in very small quantities, as a by-product of the coke-ovens at Karabük.

6. A new chemical factory is planned near Kütahya, using electric power to be generated there (p. 223).

In addition to the above there are small dyeworks at Izmir and elsewhere, and mineral-water factories at Istanbul, Izmir, Balikesir, Malatya, and other towns.

Oil

There is a plant for manufacturing synthetic oil at Karabük, where 2,000 gallons of motor spirit and 2½ tons of benzol are produced daily. A synthetic petroleum plant, using lignite, is proposed at Kütahya. Small refineries are reported in Mardin, but unconfirmed. A refinery, whose location is still undecided, may be built for the newly discovered oil deposits in south-east Turkey (p. 114).

Rubber

Rubber does not grow in Turkey; about 750 tons of crude rubber must be imported annually for the one factory (location unknown) which makes tyres. Other rubber goods have also to be imported.

Cement

There are now (1942) five cement factories, formerly private, but now believed to be owned by the State. They employ about 3,200 people. Annual productive capacity in 1935 was as follows:

Kartal (photo. 66)	70,000 tons
Zeytinburnu (Istanbul)	70,000 ,,
Darica	50,000 ,,
Ankara	30,000 ,,
Eskihisar	..

A sixth factory was being built at Sivas in 1938, but production had not started in August 1942 because of the loss of equipment in Bulgarian waters; its yearly capacity of 75,000 tons should raise total Turkish production to meet home demands.

Two further factories are planned, one at Karabük to use blast-furnace waste, which makes excellent quick-drying cement, and

another on an unknown site. Production and imports in recent years were as follows:

	Production	*Imports*
1936	193,000 tons	..
1937	225,000 ,,	..
1938	286,000 ,,	50,000 tons
1939	289,000 ,,	85,000 ,,
1940	267,000 ,,	83,000 ,,
1941	241,000 ,,	..

There are said to be brick-works at Izmir, Balikesir, Manisa, and Kirşehir, besides many local kilns.

Pottery

Kaolin is mined in many parts of Turkey, notably near Silifke, Kütahya, and Kartal. Glazed pottery, or faïence, of vivid colour and beautiful design, has been made for centuries, both for domestic pottery and for tiles used in interior decoration (photos. 55, 56). Kütahya, the most famous centre, has a china factory producing about 750 tons yearly (half Turkey's demand). An old ceramic factory, apparently attached to the Sultan's palace in Istanbul, was bought by the State; another was opened at Isparta in 1938, and one is planned at Izmit. China is made on a small scale in many other places.

Glass

Good glass-sand occurs at Çatalca, north-west of Istanbul, and is sent to Paşabağçe on the Bosporus and to Istanbul. In the 1934 Plan about £T1½ millions were allotted, through the Iş Bank, for glass-works at Paşabağçe, one for bottles and one for plate-glass, but only the first is said to be operating. It employs about 850 people, uses about 8,500 tons of sand, lime, and soda yearly, and produces about 25 million pieces of glass-ware. The capacity of the second is for 2,000 tons a year (photo. 67).

Electricity and Gas

Although Turkey has made great progress in industry during the last twenty years, her development of electricity and gas has been slow.

Electricity

Electricity was banned in Turkey until 1900; afterwards progress was slow and mostly under foreign control until the Republic

entrusted its development to the Eti Bank. Even to-day Turkey is one of the most backward countries in the world in electricity; in 1937 she used only 10 units per head compared with 350 units in Great Britain and 1,200 in Sweden. By 1941, however, both public and industrial stations were in operation, and several new schemes were in hand.

The ratio between capacity and output of stations is very low. A typical figure is 15 per cent., indicating that electricity is used for lighting rather than for industry (p. 222). In 1940, 174 towns had electric lighting compared with 124 in 1936. Istanbul supplied 126,820 consumers (16 per cent. of its population), Ankara 19,591 (12 per cent.), Izmir 16,316 (9 per cent.), Bursa 9,644 (12 per cent.), Eskişehir 4,500 (7 per cent.), and Trabzon 3,525 (10 per cent.).

The highest distribution voltage in the country is 35 kV., fed from the Istanbul station, and there are 22- and 20-kV. lines from Kayseri and Ankara, but none of these combines sufficient voltage and capacity to have any effect on national distribution. There is no grid system, there are very few sub-stations, and it is unlikely that any distribution lines exceed 30 or 40 miles. In 1940 the total length of high-tension lines was 620 miles, of low tension 2,683 miles. There is no electrical link with surrounding countries, and apart from an unconfirmed report of a start in the Zonguldak locality there are no electrified railways. The larger plants generate alternating current at the standard frequency of 50 cycles, and supplies are generally available locally for lighting and power at 220–380 volts. There are a few direct-current plants.

Emergency measures (e.g. underground gas turbines as at Istanbul) are said to have been planned in the large cities against risk of war-time damage to the main stations.

Public Stations. The following were the most important public power stations in 1940; others are all of under 1,000-kW. capacity:

Place	*Type*	*Capacity (kW.)*
Istanbul . . .	Thermal	58,780
Kozlu . . .	,,	10,300
Ankara . . .	Thermal and diesel	8,686
Izmir . . .	Thermal	5,000
Adana . . .	Diesel	2,144
Bursa . . .	(*unknown*)	1,384
Konya . . .	Hydro and diesel	1,082
Eskişehir . . .	Diesel	1,040
Trabzon . . .	Hydro	1,040

Istanbul. This plant, at the upper end of the Golden Horn, 4 miles

from Istanbul, is built on swampy ground at the junction of the Silahtarağa and Kâğithane rivers. It is State-owned, and is by far the largest station in Turkey. Converter sub-stations supply an electric tramway system, and at Vaniköy sub-station voltage is stepped up to 35 kV. for the Kartal and Zeytinburun cement works and for the Princes' islands.

Kozlu. The *Official Turkish Statistical Yearbook* for 1940 records one public and two industrial stations at Kozlu, but the former may be at Kirikkale, where a public station with a capacity of 12,000 kW. is reported from another source. One of the industrial stations at Kozlu is known to supply electricity to the town.

Ankara. The plant is half a mile north-east of the main railway station and is combined with the gas-works. An old diesel station in a separate building is linked with the main plant. The load is partly industrial, and feeds the local cement works, but there is no long-distance transmission.

Adana. The Adana power station is on the right bank of the Seyhan, between the new railway station and the iron railway bridge across the river. There are 7 miles of distribution line.

Trabzon. This is probably the largest hydro-electric installation in Turkey; it is about 8 miles west of Trabzon, 6 miles up the Kalenüma river. There is a single pipe-line from the dam above the power station. Distribution lines to Trabzon and Akçaabat probably follow the coast road.

Eskişehir. This plant may supply the local cement works; the railway workshops and the sugar factory have their own installations.

Approximately 82 per cent. of the total installed capacity of public stations is steam generated, 11 per cent. diesel, and only 6 per cent. hydro-electric; the steam capacity figure is inflated by the inclusion of Istanbul. The following table gives figures for 1940:

	No. of stations	*Installed capacity (kW.)* A.C.	D.C.	*Production (kWh.)*
Thermal	59	111,470	283	202,588,000
Hydro-electric	29	8,999	113	11,309,000
Diesel	86	14,572	1,133	21,013,000
Total	174	135,041	1,529	234,910,000

The three largest stations, Istanbul, Ankara, and Izmir, account for nearly 80 per cent. of public output. Details of production and consumption are given overleaf:

Production and Consumption of Electric Power in Istanbul, Ankara, and Izmir, 1940

(in thousand kWh.)

	Istanbul	*Ankara*	*Izmir*
Production	146,933	22,401	10,799
Consumption:			
Factories	65,130	10,528	4,431
Tramways	16,584	..	1,228
Industrial uses (State)	5,370	787	80
Industrial uses (Municipal)	3,649	239	..
Lighting (State)	3,623	1,449	431
Lighting (Municipal)	5,234	1,125	458
Private lighting	23,596	3,849	2,397
Total	123,186	17,977	9,025

Consumption for all Turkey during 1940 was as follows:

Lighting	67,610,000 kWh.
Industry[1]	114,166,000 ,,
Tramways	17,812,000 ,,
	199,588,000 ,,

The thermal stations use coal from Zonguldak and are therefore independent of imports. The diesel generators, on the other hand, are entirely dependent on imported fuel, though none are of any great importance. Coal, both local and imported, is expensive, and the use of Turkish coal for electricity is deprecated when it is needed for coking-ovens, railways, and ships. Fuel of various types consumed by the public stations during 1940 amounted to:

Coal and lignite	220,431 tons
Fuel oil	6,308 ,,
Wood	2,495 ,,
Charcoal	1,996 ,,

A 1933 estimate placed the potential hydro-electric resources of the country at about 400,000 kW. Only about 2 per cent. of this has so far been utilized, but several projects are being considered (p. 224).

Industrial Stations. The use of electricity in industry is increasing steadily, but information on industrial plants is incomplete. It is clear that the Kozlu and Karabük stations, and possibly one at Kirikkale, unless this has been confused with Kozlu, are of relatively high importance, as they supply a large proportion of the power used

[1] 'Industry' apparently means 'factories', and probably includes factory light and heat.

in Turkey's coal-mines, steel industry, and armaments. In 1940 there were fifty-four main industrial stations and some smaller ones. Total capacity of industrial stations was 110,976 kW., and production 143,490,000 kWh. Twelve of these stations supplied 2,932,274 kWh. to towns, nearly half from Kozlu.

Projects

Among the more important new schemes, most of which are hindered by the war, are the following:

1. At Çatalağzi (between Filyos and Zonguldak) a 60,000-kW. station is to be constructed to use Zonguldak coal and to supply power to a projected harbour and to all the coal-field. The Eti Bank gave the contract to Metropolitan Vickers Electric Co., Ltd., in April 1940, and the scheduled cost is £T1,500,000. The initial generating plant of three 20,000-kW. turbo-alternators, will operate at 3,000 r.p.m. Sea-water, supplied from a shore pump-house, will be used for cooling. Auxiliary service includes 375-kW. diesel engines. Transmission to the sub-stations will be at 66,000 volts, while the main alternators will generate at 11,000 volts, stepped up by outside transformer. To pool electric resources throughout the coal-field, a high-voltage line to link with the station at Karabük is also planned. At present Karabük electricity is obtained from a gas thermal station, but the gas supply varies according to activity in the coking-ovens and blast furnaces, and the provision of electricity is therefore uncertain. The direct use of coal from the Zonguldak region would not be economical, so the alternative of a link with Çatalağzi has been welcomed; on the other hand, when gas is plentiful at Karabük, surplus electricity could be transmitted to Çatalağzi.

Electricity from Çatalağzi is to be used in the Izmit paper and chemical works. Power could also be transmitted to Istanbul, where present supplies are inadequate and dependent on fuel from outside the region, but the scheme is said to be impractical for several reasons. First, the cost of Çatalağzi electricity will be high, since the station will use coal; second, the coastal grid would be vulnerable; and third, it would be more in accord with Turkey's national economy for Istanbul to obtain supplies from the proposed lignite station at Kütahya, for this would use a cheap and abundant fuel, and a route shorter by 25 miles than that from Çatalağzi.

2. A large thermal station is to be built at Kütahya, using local lignite, which is abundant and of a quality suitable for producing electricity, but, since it crumbles and has a low calorific value, not

for transporting nor for using directly in homes and factories. The station will use about half a million tons of lignite annually, and will have a capacity of 60,000 kW., intended for industrial as well as for municipal needs.

3. At Çağlayik, on the Sakarya, 22 miles north-west of Polatli, a hydro-electric station is planned where the river flows through a gorge and has a considerable fall. A barrage 85 feet high will increase the fall to 225 feet, and a tunnel nearly two miles long will carry the water, which will have a potential energy of 70 million kW. This will be one of the few important hydro-electric stations in Turkey, and will cost about £T6 millions, taking 2½ years to construct. A grid of 100,000 volts will supply Ankara, and at first only 15,000 kW. will be generated, but as demand increases this figure will be doubled.

4. Plans are now under consideration for the electrification of the Aegean region from a station on the Gediz at Adala, where irrigation works are under construction. A grid network will connect Adala, Turgutlu, Kemalpaşa, and Izmir; Salihli, Ödemiş, Tire, Torbali, and Izmir; Ödemiş and Nazilli; Turgutlu, Bayindir, Tire, Aydin, and Nazilli (fig. 53).

5. The Atranos and Balat rivers, tributaries of the Kirmasti, are under investigation, as they could probably provide power, though their regimes are irregular and there are no extensive collecting grounds behind the possible barrage sites.

6. The Dalaman, Eşen, and Manavgat rivers have been surveyed and found to be potential sources of energy. The Dalaman is said to be capable of supplying 90,000 kW.

7. A hydro-electric station is projected on the Kadincik river, about 19 miles from Tarsus, 31 miles from Mersin, and 37 miles from Adana where most of the power would be consumed. Two falls on the river are to be utilized, the first capable of generating a minimum of 12,500 kW., the second of 9,000 kW.

8. A project is in hand to build irrigation works and an electricity station on the Zamanti river (upper Seyhan). The station is to be the basis of an electro-metallurgical industry.

9. Plans are in hand for small hydro-electric stations at Gümüşane on the Harşit Su, at Sariköy on the Keçidere, and at Erzincan. The Fırat and Murat valleys near Keban have been surveyed with a view to building a barrage and hydro-electric station; the Çalti river has also been surveyed, by order of the Eti Bank, as a source of power for the Divrik iron mines, and the Bank is investigating possibilities of hydro-electric power at Ergani copper mine.

The State Administrative Board of Electricity (E.I.E.) is working on the above schemes and on others, including surveys of the Kelkit and Dicle (Tigris) rivers. Every fuel deposit discovered by the Institute of Mining Research is also considered as a possible site for a thermal station.

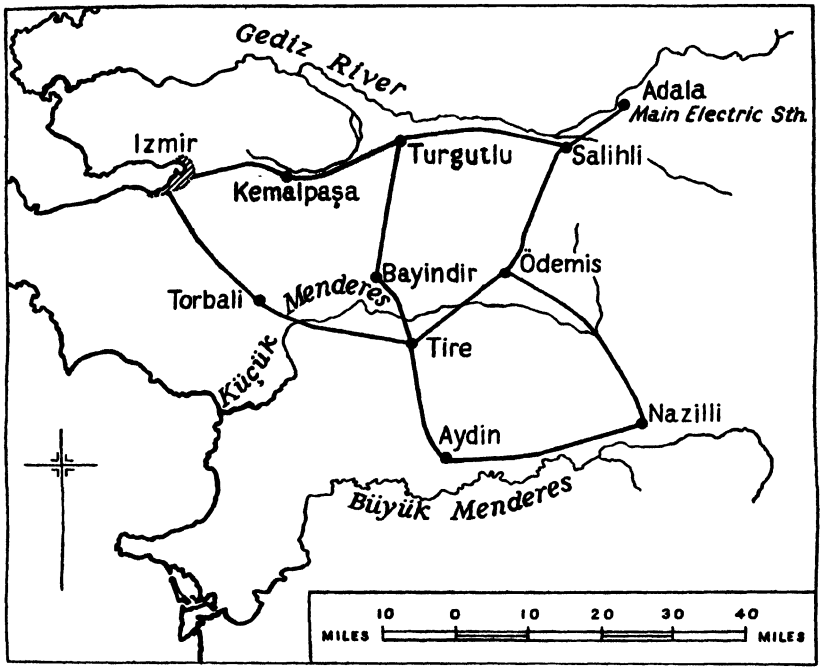


FIG. 53. *Proposed Adala–Izmir–Aydin Electric Grid*

Gas

Gas is also used for domestic and industrial purposes, but even less than electricity. The chief public gas-works are in the Istanbul district (6 gasometers)[1], at Ankara (1) and at Izmir (1). Consumption of gas in these three places in 1940 was 622,670, 139,160, and 63,700 thousand cubic feet respectively, the distribution for various purposes being in the following percentages:

	Private use	*Factory use*	*Public lighting*	*Government offices*
Istanbul . . .	75	14	6	4
Ankara . . .	65	24	..	11
Izmir	21	8	68	3

[1] Istanbul (2), Beyoğlu-Yeniköy (3), Kadiköy (1).

Thus in Istanbul three-quarters and in Ankara two-thirds of the gas produced is privately consumed, while in Izmir two-thirds is used for public lighting. Ankara is publicly lit by electricity. More than one-third of that from the Kadiköy gas-works of the Istanbul district is used for public lighting and none for factories.

There are also small industrial gas plants in the Istanbul and Ankara districts for special purposes: the bomb factory of Şakir Zumre (Istanbul), Atatürk's model farm at Çiftlik (near Ankara). There may be some of minor importance at Izmir, and there is a large one at Karabük, which produçes coke-oven gas and blast-furnace gas for the iron and steel works.

SHIPPING AND COMMERCE

Shipping

Turkey has about 3,000 miles of coastline, but few large ports. Istanbul is the most important because it is also a natural outlet for much of south-eastern Europe and is the port of call and transit depot between the Mediterranean and the Black Sea. The most fertile, though not the largest, agricultural areas are on the coast, especially in western Anatolia, and Trabzon, Sinop, Mersin, and Antalya make good use of poor harbours; Izmir alone is a great natural port. Trabzon, like Istanbul, draws its commerce from afar. (For the description of these and other Turkish ports *see* Chapter XII.)

Turkish sailors are skilful and bold; they have profited by former Greek and Italian experience and by their own long monopoly of the Black Sea. But in the Aegean and Mediterranean, Greek competition almost abolished Turkish shipping; even the lifeboat service fell into foreign hands, and the transfer of Samos, Khios, and Lesbos to Greece and of the Dodecanese to Italy, cut off the chief seafaring populations.

The Government is making great efforts to build up a maritime fleet to meet the needs of the country, and to compete with the foreign shipping which, until 1935, was over 36 per cent. of the tonnage using Turkish ports (fig. 54). The Lausanne Treaty limited coasting-trade and pilotage to Turkish subjects, though there were residual foreign services until 1925. The efforts of the Government have been concentrated firstly on developing the coastwise services, and secondly on acquiring large passenger ships so that Turkey may take

her place in the passenger-carrying trade of the Mediterranean. The control of shipping was vested in the Deniz Bank (p. 184), and has now been taken over by the Ministry of Communications. Since 1930 many vessels have been bought abroad, including the *Bakir* (4,580 tons), *Demir* (3,700 tons), and the *Krom* (3,360 tons), from the United Kingdom in 1938 for the ore traffic. The mercantile marine, though

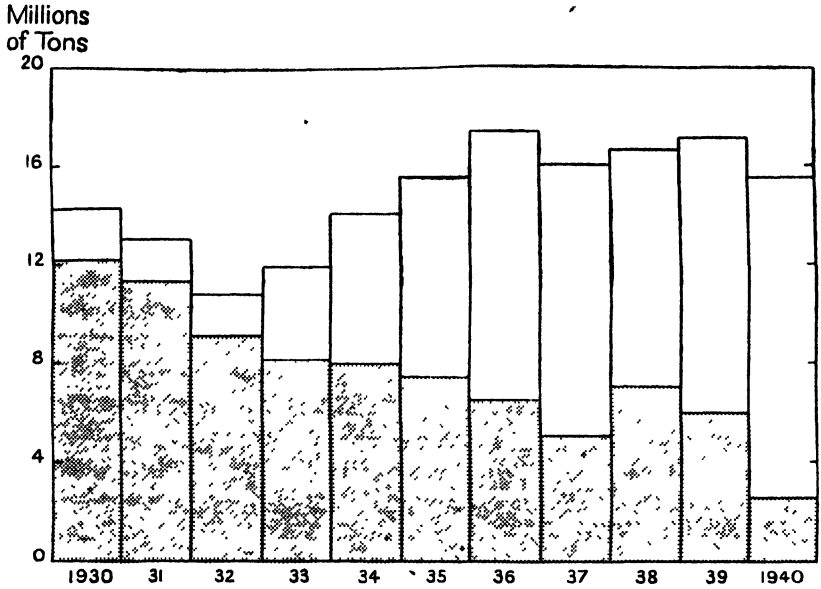


FIG. 54. *Turkish and Foreign Tonnage using Turkish Ports, 1930–40. (Foreign tonnage stippled)*

still small, is therefore increasing, and is now 29 per cent. greater in tonnage and 61 per cent. in number of vessels than in 1930.

Mercantile Marine. Steamers of over 50 tons

Year	*Number*	*Tonnage*
1932	175	174,117
1933	178	164,619
1934	179	189,219
1935	195	200,424
1936	190	201,237
1937	184	194,582
1938	278	212,565
1939	287	219,592
1940	290	217,381

In the traffic of the principal ports, Turkish vessels have now preponderance over foreign vessels, and though the latter are larger, they are less frequent, and more concentrated in Istanbul.

Tonnage and Number of Ships entering and leaving the Chief Ports in 1938 and 1940

		1938		1940	
		No.	*Tonnage*	*No.*	*Tonnage*
Istanbul:	Turk.	19,101	2,129,419	16,851	2,220,518
	For.	2,415	4,236,416	1,396	1,966,315
Izmir:	Turk.	1,785	560,897	1,813	455,120
	For.	764	1,046,903	238	82,549
Mersin:	Turk.	1,199	279,744	1,274	143,613
	For.	374	476,683	146	128,762
Samsun:	Turk.	1,893	850,047	2,049	829,690
	For.	65	96,336	9	16,820
Trabzon:	Turk.	3,758	851,043	3,073	775,598
	For.	34	39,903	3	2,772
Giresun:	Turk.	3,145	769,274	2,815	765,715
	For.	24	29,423	7	9,437

The regional distribution of Turkish and foreign shipping in 1938, before the outbreak of war interfered with overseas trade, was as follows:

		No.	*Tonnage*
Marmara:	Turk.	33,840	3,818,099
	For.	3,034	4,595,913
Mediterranean and Aegean:	Turk.	14,767	2,923,172
	For.	2,281	1,857,145
Black Sea:	Turk.	42,622	9,931,233
	For.	444	682,037

From this it can be seen that little foreign shipping uses the ports of the Black Sea, but in the Marmara region it exceeds Turkish shipping in tonnage though not in numbers. The average size of foreign vessels trading in the Black Sea and Marmara (1,520 tons) is, however, considerably greater than in the Mediterranean (814 tons); so, too, is that of Turkish vessels (233 tons), though this is only one-seventh of that of foreign ships. The proportion of small Turkish vessels is greatest in the Marmara region, of small foreign vessels in the Mediterranean.

For an analysis of foreign shipping using Turkish ports, the Marmara region is most suitable. In 1938 vessels entering and leaving those ports were of the following nationalities:

	Number	*Tonnage*
British	539	1,189,842
Italian	428	706,332
German	282	461,033
Romanian	191	371,432
Greek	800	324,952
American	90	298,926
French	63	240,173
Polish	54	198,927
Russian	79	156,970
Dutch	98	127,405
Norwegian	66	120,591
Bulgarian	86	113,734
Swedish	95	100,442
Others	109	132,151

From the average tonnages it will be seen that the French (3,800), Polish (3,700), American (3,300), British (2,200), and Russian (2,000) vessels included large cargo vessels, while Greek (400), Swedish (1,050), Dutch (1,260), and Bulgarian (1,330) were considerably smaller.

Commerce

Since the discovery of the sea route to the Indies, and still more since the opening of the Suez Canal, the ancient and medieval caravan traffic has been reduced to a modest trade out of Persia and Iraq to Trabzon and Iskenderon; Istanbul now attracts little but luxury goods across the eastern frontier of Turkey.

Turkey, primarily an agricultural country, supplies very few manufactured goods to world markets. Since the founding of the Republic her foreign trade has been an interesting index to her national economic policy and its relation to world conditions. Trade declined until 1927 because of the poverty of the country and the concentration of effort on internal reorganization. But by 1929, in response to general world prosperity, trade had almost recovered to what it was in 1925, for Turkey could obtain good prices for agricultural commodities and use the revenue to purchase manufactured goods. The world economic depression which followed affected Turkey severely. In November 1931, to prevent complete unbalancing of the national economy—although the trade balance had become favourable the previous year—quota had to be introduced, and these effected a further decrease in trade, until in 1934 it was less than half the 1925 figure. With better agricultural conditions and the import of industrial machinery, commerce had again improved by 1938. The outbreak of war brought another decline, though this might have occurred under normal conditions, for Turkish policy now aims at self-sufficiency.

From 1924 until 1930 the balance of trade was always unfavourable (fig. 55), but since 1930 it has remained favourable except for 1938, when large quantities of machinery were imported from the United Kingdom for industrial development under the Five-Year Plan. Trade is now controlled by the Government, and almost all is conducted by clearing or similar agreements. In 1937 trade with clearing countries accounted for 76 per cent. of the total value.

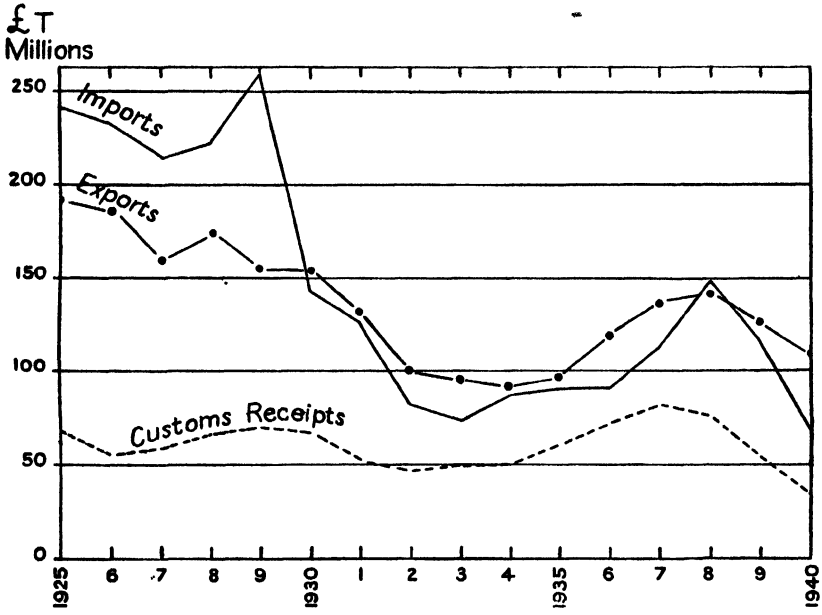


FIG. 55. *Turkish Trade, 1925–40*

The list of principal commodities (App. C) illustrates the general character of Turkish commerce.

Exports are almost wholly animal or vegetable products—tobacco (27 per cent.), fruits and nuts (25 per cent.), cereals (9 per cent.), cotton (7 per cent.), animal products (5 per cent.), and live animals (2 per cent.) accounting for three-quarters of the exports in 1938. The relatively small amounts of surplus cotton and wool are due to the demands of the new industries, which are still unable to supply home demands and will soon require the whole output of these raw materials. Carpets, the only manufactured goods exported, have never recovered from the transfer of the Greek weavers to Greece. Chrome, on the other hand, a new export, accounts for over 3 per cent. of the total,

and already provides 19 per cent. of the world's supply. Recently it has all been sold to Great Britain under agreement, and an alternative agreement with Germany seems to have been inoperative for lack of equivalent German goods.

Imports are chiefly manufactured goods not yet supplied by home industry. In 1938 yarn and manufactured goods of cotton and wool made up 20 per cent. of the total imports. Iron and steel (19 per cent.), machinery (15 per cent.), petrol, benzine, and heavy mineral oil (4 per cent.), and foodstuffs (5 per cent.) together made up another 43 per cent. Coffee is the only luxury, and accounts for the unbalanced trade with Brazil. Foreign sugar is quickly being replaced by home-grown beet.

Distribution of Foreign Trade

The distribution of Turkey's foreign trade in 1938 is shown below, where the chief countries are listed in order of importance as suppliers or purchasers:

	Imports		*Exports*
Germany	47·0%	Germany	42·9%
United Kingdom	11·2%	U.S.A.	12·3%
U.S.A.	10·5%	Italy	10·0%
Italy	4·7%	U.S.S.R.	3·6%
U.S.S.R.	3·9%	Czechoslovakia	3·4%
Czechoslovakia	3·8%	United Kingdom	3·4%
		France	3·3%

Germany has always had the predominant place since the foundation of the Republic. With her economic dependencies in central Europe, she has been able to offer high prices, and cheap subsidized goods in return, thus taking or supplying nearly half the entire foreign trade of Turkey. From 1933 until 1938 Germany bought more goods from Turkey than she supplied, but since 1938 the position has been reversed. In 1938 she took the greater part of Turkey's export of tobacco, nuts and fruit, barley, valonia, mohair, and chrome, and supplied the greater part of the woollen yarn and manufactured goods, machinery, and paper.

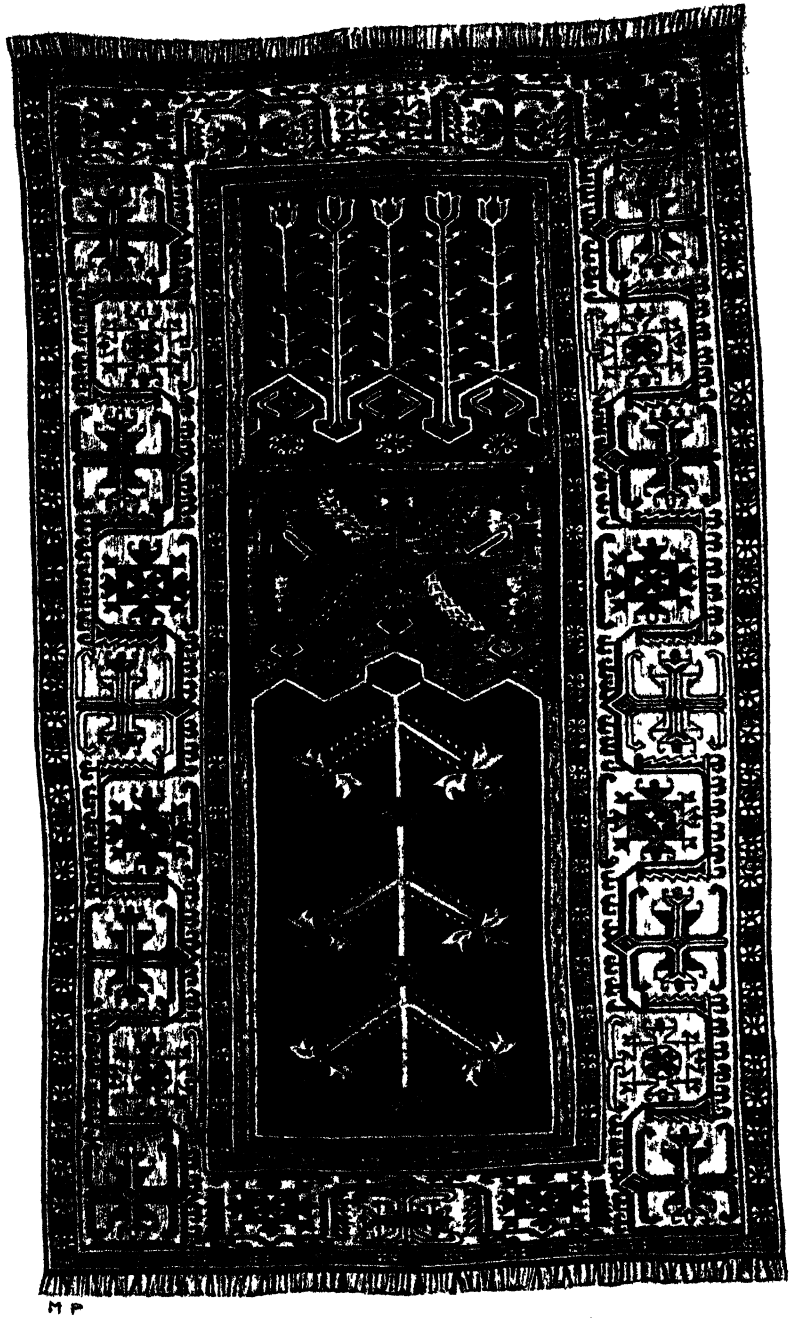
The United States buy from Turkey considerably more than they sell, the amounts varying from year to year, increasing until 1938, but decreasing since that year. They take most of the export of washed wool, and supply most of the petrol and benzine.

Great Britain's early industrial expansion and marked contrast of products achieved in the nineteenth century a predominant place in Turkish commerce, a position severely damaged by Turkish industry.

Moreover, Turkey's central position in world markets provides alternative sources of supply and keeps prices low. From 1931 until 1936, however, Britain supplied more than she bought, though, except in 1938, this trend has since been reversed. In no commodity of Turkish commerce did Britain take first place at the outbreak of war in 1939.

The Balkan lands are too poor to take much share in the transit trade to European markets, and their own products resemble too much those of Turkey for profitable exchange. With Italy, on the other hand, though it is a Mediterranean land, there has been long-standing interchange of characteristic produce, according to varying yields. Turkey's balance of trade with Italy is always favourable, for Italy takes the greater part of Turkey's exports of raw cotton and olive oil, supplying in return most of the import of cotton goods. France differs more in its produce, and developed its industry earlier than Turkey; but like Britain was one of the first countries to suffer from the Turkish industrial movement. Since 1936 Turkey has had a favourable balance with France, which takes most of the opium export. Russia, differing greatly in resources, but long without industry, has usually been a good customer, and is little affected by modern changes. She takes most of the livestock and wool in the grease. India supplies most of the imported cotton yarn and tea, Czechoslovakia the sugar, and Romania the heavy mineral oil. Greece is important as a customer for wheat and eggs; Japan takes more from Turkey than she supplies, but by 1939 her trade was insignificant.

Most of Turkey's imports reach her through the Marmara ports (80 per cent. in 1938, 85 per cent. in 1940). Next in importance come those of the Aegean, with 9 per cent. in 1938 and 7 per cent. in 1940, followed by Mediterranean ports with 7·5 per cent. in 1938 and 4 per cent. in 1940. The ports of the Black Sea take only a small share of the imports (2 per cent. in 1938, 1·6 per cent. in 1940). The Aegean ports handle most of the exports (42 per cent. in 1938), but since the war those of the Marmara have taken first place, with 57 per cent. in 1940. The Black Sea ports are much more important as outlets for Turkish produce than they are for receiving supplies from abroad; in 1938 they handled 14 per cent. of the exports; 7 per cent. in 1940. Since the war they have been surpassed by those of the Mediterranean (8 per cent. in 1940). A small amount of exchange takes place across the land frontiers, that with Russia being the largest. Imports here about equal exports, but the Syrian frontier until 1938 easily took first place in exports from Turkey (App. D).



68. *Ladik Prayer-Rug* (*about* 1800)

NOTE ON TURKISH RUGS AND CARPETS

Among the most interesting products of Turkey are the carpets and rugs which have been imported into England since the sixteenth century. Their first arrival was the sequel of a bargain—not according to the best traditions of British diplomacy—between Cardinal Wolsey and the Venetian Ambassador. The cardinal wanted no less than a hundred 'Damascene' carpets, and in return was prepared to support the repeal of duties on the wines which Venice exported to England. In 1518, after two years' hard bargaining, he appears to have got most of what he wanted, and about sixty rugs seem to have reached him. No trace of them now remains, but we know what they and others of that century looked like from contemporary paintings, especially by Holbein, whose name has become attached to a particular type of carpet with geometrical designs and brilliant colours.[1]

Turkey carpets provided models for carpet-making in England and continued themselves to be imported in increasing numbers until their competition became too much for the domestic products. When the manufacture of carpets in England was revived in the second half of the eighteenth century it was under French influences at first and then under the direction of British decorators and architects such as Robert Adam, whose trend of taste was very different from the oriental; possibly oriental rugs were less esteemed in England (though they continued to be imported) during the second half of the eighteenth and the first half of the nineteenth century than at any period since Wolsey. From then to the present day they have ranked very highly indeed, not only as useful and durable floor-coverings but for their intrinsic attractiveness; at their best they are taken seriously by artists as works of art.

Whether the productions of the present day can be so regarded is more doubtful. The exports from Turkey now fall into two classes: (i) the large 'Turkey Carpet', so familiar in the Victorian dining-room, produced for the European market by comparatively large-scale manufacture in such centres as Smyrna (Izmir) and Oushak (Uşak); these have great merits, being still made by hand of good wool, but are now perhaps more generally esteemed for their utility than their beauty; (ii) a considerable variety of smaller rugs, often in the familiar 'prayer-rug' form made in various parts of Anatolia and commonly included along with Caucasian, Turcoman, Afghan, and Baluchistan products under the general title of 'Persian rugs'. With these the process of commercialization has not gone so far and there are still very attractive specimens to be had.

[1] The 'Holbein' design was a chequer of squares alternately light and dark, with octagonal panels in each square and diamond-shaped figures intersected by the corners of the squares, the whole ground being worked over with interlacing strapwork. Much the same pattern of octagons and diamonds still survives in the modern 'Bokhara'. Other favourite types of the period were made out in arabesques, regularly spaced, often in yellow on a red ground.

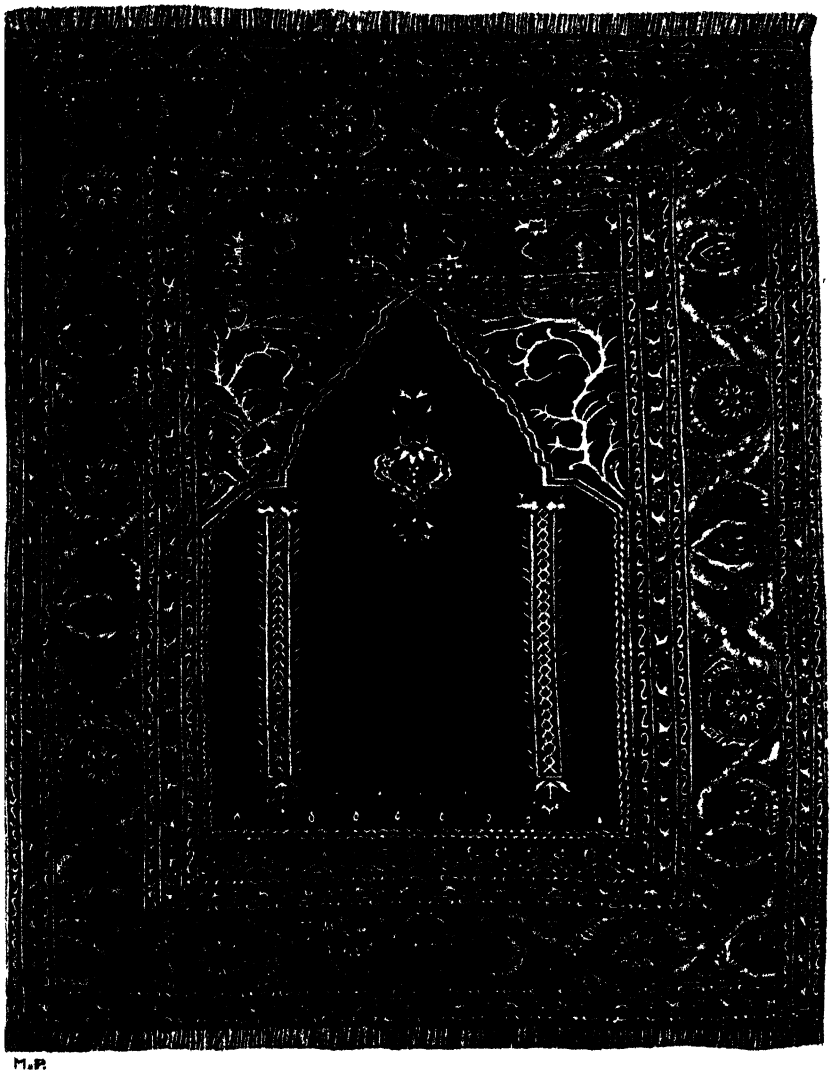
It is clear, however, that the making of fine rugs by hand requires much time and work and that the future of their manufacture in Anatolia depends on the general economic conditions there and the cost of labour; their price, at any rate, must rise very steeply in proportion to the improvement in wages which is already taking place. Another cause of decline for all oriental rugs is 'europeanization'. Since about the middle nineteenth century, and even earlier in some parts of Anatolia, the design and manufacture of these rugs has been increasingly governed by the demands of the European market; the old colours and patterns have been adapted to European taste, synthetic dyes introduced, and wool imported from Australia: the paradoxical result of these adaptations has been a decrease in the attractiveness of these rugs to Europeans, and accordingly, especially in Persia, deliberate attempts have recently been made to return to and maintain the traditional native design and methods. The results, however, seem sometimes rather flat and artificial, and the rugs now being produced will seldom bear comparison with the older models for liveliness of design or colour, even if they are often extremely well made and hard wearing.

For collectors, naturally the most desirable specimens of Anatolian work are the magnificent products of the sixteenth and seventeenth centuries, already mentioned, plainer and more geometrical in design than the contemporary work of Persia (mainly, no doubt, because of the stricter interpretation in Turkey of the Islamic veto on the representation of living forms), but in their own way as fine as any carpets need be. They are, of course, proportionally expensive and difficult to obtain.

Next in interest and value come the rugs made between the middle eighteenth and the middle nineteenth century, after the modern types of pattern had been established but before the process of europeanization or commercialization had gone too far. Those are the types which have become standardized and are still being reproduced. There are still fine examples of them to be had, especially in the prayer-rugs for which Anatolia is famous.

With rare exceptions, Turkish rugs are knotted on a woollen foundation; the knotting is not generally very fine by oriental standards. There are a few fine silk rugs on a corded silk warp; the inexperienced should beware of their cheap (and very nasty) imitations made of waste silk, crudely dyed, on a cotton basis. The range of colours is less on the whole than in the Persian types; red verging towards vermilion, blue, and yellow are the favourite dyes, while green (having sacred associations in Islam) tends to be avoided except occasionally in prayer-rugs. Designs are more angular and disconnected than in Persia, no animal forms are introduced, and the floral work is stylistic and non-representational.

Among the prayer-rugs, perhaps those of Ghiordes (Görde̊s), Ladik, and Kulah (Kula) are the most sought after; the Ghiordes especially, although its reputation has somewhat declined, may still command very high prices. Usually on a ground of soft red (sometimes yellow) with a



69. *Ghiordes Prayer-Rug (early 19th century)*

pleasant blue, it represents, within its elaborate borders, a steeply pointed arch (the *mihrab* or niche of a mosque) generally with a decorative lamp hanging from the top and two narrow decorative strips, vertically along the sides; it has two panels set across (or horizontally), one below and one above the niche. Those two panels and the steepness of the arch provide the easiest identification for the type.

Ladiks (from the old town of Laodicea near Konya) are also attractive rugs, less europeanized than most, but now getting scarce. They have usually a dull red ground and a comparatively flat, indented arch and can be distinguished by the five Rhodian lilies, with long straight stems and leaves growing from them, which are arranged in a panel either above, below, or at both ends of the niche.

The main colouring of the modern Kulahs is generally brown or brown-yellow without any red; the characteristic feature in their design is the series of very narrow border-stripes dotted with flecks; in other respects they resemble the Ghiordes.

Among other Anatolian types of interest to collectors are the Bergamas, rugs from Melhaz (Milas) and Makri, and the Yuruks.

The name 'Bergama' is used for many of the peasant and nomad rugs of the interior, rather square in shape, bright and varied in colour, characteristic in pattern through their angular medallions and bold figures, large in proportion to the size of the field. They show a lustrous light blue which is very distinctive; other details which help to identify them are the coloured end-webs, occasionally small tufts at intervals along the sides (as in Shiraz rugs), and still more rarely 'talismanic' tassels projecting from the pile of the rug itself.

Melhaz rugs have also kept fairly true to their traditional colours, especially in their yellows and in a particular plum-coloured blue. They tend to have wide borders relatively to the interior field.

Yuruks, rather roughly made in the mountainous districts of eastern Anatolia, have a long pile, deep but lustrous colouring, and bold and simple patterns rather close to some of the Caucasian types. They can still be found sometimes with their native character unaltered.

CHAPTER XVI

COMMUNICATIONS

General Remarks

In the fifteenth and sixteenth centuries the Ottoman Empire had one of the finest road systems in the world, all the most important towns being linked together by well-engineered highways and fine bridges. There were chains of posting-houses, inns for travellers, and all the machinery of a sound transport organization suitable for the needs of the period. This fine system decayed as the Empire declined and was already derelict before the railway era.

In the nineteenth century railway development was extremely slow. The Empire was too extended, Anatolia too mountainous, and the country too poor for the State to undertake construction; economic development was too backward for an adequate return to be expected from a railway policy planned to cover long distances. In the west, where an industrious Greek people worked in the rich valleys that lead to the Aegean, some inducement was offered to European capital to construct railways based upon Smyrna, though even here only under strict financial guarantees from the Ottoman Government. Elsewhere the motives behind railway building were based on the important strategic position of Turkey between Europe and Asia.

Though the Ottoman Government began to build two of the early railways, lack of resources forced them to hand over the half-finished lines to European concessionnaires, and these took their place with the rest as lines built, controlled, and worked by foreign capital, British, French, and German; and though there was rivalry rather than clash between British and French interests, the rise of Germany and her successful bid for the construction of the Baghdad Railway brought insecurity and diplomatic difficulties in the west, while in the east Russia strove to prevent not only the building of railways but even the repair and maintenance of roads.

The heavy burdens caused by the financial guarantees to the concessionnaires—particularly the kilometric guarantee granted to the Germans, which bore no direct relation to capital expenditure—weighed heavily on the Ottoman Treasury, impoverished the country still further, and limited road construction at a period when motor-cars were coming into use.

Before 1914 British and French interests aimed at developing

export and import traffic through Izmir; Germany's policy was entirely strategic and political, to extend her influence to the head of the Persian Gulf; that of Russia had the effect of thwarting the development of the eastern provinces. The Ottoman Empire had little real say in the matter. The economic and strategic handicaps of all these antagonisms led to a dearth of internal communications, which was disastrous during the War of 1914–18. The railways, all single-track lines, short of station equipment and siding accommodation, of rolling-stock and of repair facilities, were heavily overworked. The supplies necessary to maintain the fronts in Mesopotamia and Palestine were quite beyond the capacity of the unfinished single-track Anatolian and Baghdad railways, and threw an additional burden on the indifferent roads. By 1918 roads and railways were worn out. Branch lines and unimportant sections of line had been pulled up to patch and repair the railways which could no longer bear the strain imposed on them.

The War of Independence was fought with a communication system already broken down, and with part of it in Greek hands. When the Republic was founded in 1923 within severely restricted boundaries, the new State took over in Anatolia and Thrace a total of only 2,500 miles of railway and 4,600 miles of road in complete disrepair after nine years of war and internal trouble. The roads were seamed with ruts, pitted with holes, strewn with boulders; masonry bridges were ruined, the wooden ones unsafe. On the railways some sections had been closed altogether; carriage-doors were off their hinges, and compartments were neither warmed nor lit at night; trains had to crawl along on patched-up rails; none ran to schedule.

Few countries have seen such economic and social changes in so short a time as has Turkey since 1923, and none has shown so remarkable a recovery as Turkey under Kemal Atatürk. In this recovery the planning and working of a more efficient system of communications have played their part; but at the beginning a new start had to be made. The task before the Republic was to renovate the old railways as far as possible with the co-operation of the foreign countries with whom Turkey had been at war, and to extend them and link them up to form a net covering the whole country, to meet the strategic and economic needs of a State the heart of which was henceforth to be at Ankara and not at Istanbul. Ankara was no longer to be a dust-cloud at the end of a branch line of the German-controlled Anatolian railway, but the focus of the national State railways.

A long-term policy was laid down in 1925 by which a new railway net was to form the basis of the country's communications. The older railways were to be acquired by the State and nationalized. The western railways were to be linked up to a plateau system extended from the old 'Anatolian' and 'Baghdad' railways, which were to reach from Eskişehir in the west through Ankara, Kayseri, and Sivas to Erzurum and the Russian and Persian border in the east. Selected ports on the Black Sea and Mediterranean were to be developed, and railways pushed outwards to these from the plateau net. The whole was to form a grid pattern of rail communication between west and east, with transverse lines from north to south. Roads were planned to supplement the railways, to serve as auxiliaries to them, only taking the same alinement when topography or strategy demanded the strengthening of a particular route. The programme of reconstruction in each vilâyet was carefully drawn up, so that priority should be given to those railways and roads which were of greatest strategic and economic importance.

Coastal shipping was to be reorganized, and shipping services from Turkish to foreign ports to be developed. A State Department was set up to plan construction and to manage the communications in the national interest, the object being to weld the whole into a unified system by land, sea, and air.

The completion of such a programme, however, requires time and money; and though progress has been remarkable, there is still a vast amount of work to be done, especially on the roads. The difficult country through which many of these must pass, and the extremes of climate with which they have to contend, in the north and west because of rain, in the east and south-east because of summer heat and winter snow, mean a high cost of maintenance.

A summary of the position at any moment is difficult owing to the rate of progress. On 1 January 1939 there were in operation 4,578 miles of railway, of which 4,174 were on State lines. At the same time there were over 10,000 miles of roads, motorable except in very bad weather, of which nearly 6,000 were said to be in good repair. Reconstruction and repair work were in progress on much of the remainder and new roads were being built. Normal repairs were being carried out on reconstructed roads to keep them up. At the same time it would be impossible to say exactly which roads are in good condition at any moment, and which are undergoing repairs; some of the old roads have had their bends removed and their gradients eased, and have been roughly metalled but are not yet soled

or surfaced; others are motorable in fine weather but have not been converted to all-weather roads; both these types will be cut up if heavily used. An indication of the final road-net may be obtained from a study of bridge construction. The Republic inherited about 105 large masonry road bridges, of which 60 were built during the period of the Osmanli Sultans and 24 (in the Kars, Artvin, and Ağri vilâyets) were built by the Russians. Up to the end of 1941 the State had completed 120 large new road bridges, many of very graceful design.

But it should be emphasized that as yet only the main bones of the rail and road skeleton are there. Many parts of the country are still quite inaccessible by road or railway. In most of the towns in the interior it is unusual to see a motor-car with a registration number strange to the locality. There were, in January 1939, only a little over a foot of railway and a little under a yard of dry-weather motorable road per person in the country; and one mile of single-track railway to 64·3 square miles of territory is far below the needs of a modern State.[1]

I. TURKISH RAILWAYS

History

Turkish railways may be divided into two groups; those built before 1923, mostly by foreign capital, and those built subsequently, almost all by the State. This division explains why certain routes and not others were followed, and why no railways are yet to be found in some areas.[2]

I. The lines built before 1923 and taken over by the Republic may be summarized briefly as follows:

1.	Istanbul–Uzunköprü (Part of the old 'Oriental Railway', now Şark Railway)	336 km.
2.	Izmir–Aydin–Eğridir (The old Smyrna–Aidin Railway)	609 ,,
3.	Izmir–Turgutlu–Afyonkarahisar (The old Smyrna–Kassaba Railway)	428 ,,

[1] Estimated population December 1938, 17,829,214; area, 294,416 sq. miles; railway mileage, 4,578; motorable road mileage, 10,000. Compare the figures for Great Britain: 2·4 feet of railway, mostly double-track, and 7 yards of all-weather surfaced public highway per person; one mile of railway to 4·3 sq. miles of territory.

[2] In the detailed description of the railways given later, they are treated regionally without regard to their date of construction or history.

4.	Manisa–Bandirma (Formerly a branch of (3))	275 km.
5.	Mudanya–Bursa	41 „
6.	Mersin–Adana (At one time a branch of the 'Baghdad Railway')	67 „
7.	Haydarpaşa–Eskişehir–Konya (The old 'Anatolian' Railway)	771 „
8.	Eskişehir–Ankara (Formerly a branch of the Anatolian Railway)	261 „
9.	Konya–Aleppo–Nusaybin (Turkish section) (Formerly the 'Baghdad Railway')	994 „
10.	Erzurum–Sarikamiş–the Russian border (Originally built by the Russians)	356 „ [1]
	Total	4,138 km.

In the above summary the lengths of branch lines have been added to the lines on which they depend. All the lines except Nos. 5 and 10 are of normal gauge, 4 ft. 8½ in. All were built with the aid of foreign capital and were at one time managed by foreign companies. All are now controlled by the Turkish Government; and all are managed by Turkish State Railways except a section of No. 9 from Çobanbey to Nusaybin and its small branch from Derbesiye to Mardin, a total of 405 km., which in 1939 was still worked by a private company. With this exception, and with that of the 29 km. narrow-gauge (0·60 m.) line from Ilica to Palamut,[2] near the Gulf of Edremit, all the old railways have passed to the ownership of the Turkish State by purchase or treaty.

II. The normal-gauge lines completed by the State between 1923 and 1940 for the new railway net of Turkey are these:

(*a*)	*In the West*	
(1)	Kütahya–Balikesir	252 km.
(2)	Afyonkarahisar–Karakuyu with the Burdur and Isparta branches of the Izmir–Eğridir line.	150 „
(*b*)	*Across the Central Plateau*	
(3)	Ankara–Sivas–Malatya	855 „
(4)	Çetinkaya–Erzurum	437 „
(5)	Kardeşgediği–Boğazköprü	172 „

[1] This is the length of line officially stated to have been taken over. The distance between Erzurum and Leninakan is 310 km. (pp. 536–8) according to official figures. The difference is made up of the old narrow-gauge extension westwards of Erzurum, now superseded by the new normal-gauge line (59 km.), less the distance in Russian territory not taken over (13 km.).

[2] Originally intended as a mineral line, but there is a frequent passenger service between most stations.

(*c*) *Black Sea Coast Connexions*

(6) Irmak–Filyos–Zonguldak . . . . . 415 km.

(7) Kalin–Samsun . . . . . 378 ,,

(*d*) *In the South and South-east*

(8) Fevzipaşa–Diyarbekir and Yolçati–Elâziz branch . 528 ,,

Total . . . . . 3,187 km.

The lengths of branch lines have been added to the lines on which they depend. All these new railways are single track throughout and of normal gauge, 4 ft. 8½ in. A short narrow-gauge (0·75 m.) line from Samsun to Çarşamba, 39 km. long, was built privately in 1934 and so has not been included in the above summary, though it has since been purchased by the State. The dates of completion of the various sections of these eight lines are given in the table on p. 252. Those not completed in 1940 are not included. Some notes on these and on projected lines are given on pp. 251–7.

LINES COMPLETED BEFORE 1923

The construction of the first Turkish railway was due to the initiative of British financiers. Railways were still in their infancy when Great Britain began to interest herself in the internal communications of Turkey. In 1831 Colonel Chesney submitted a project for a strategic road between the Mediterranean and the Persian Gulf in order to shorten the route to India by avoiding the long detour by the Cape. Not only was the idea welcomed by the British Cabinet, but Parliament voted a credit of £20,000 and the East India Company decided to invest £10,000 in the enterprise. The introduction of railways, however, rendered the whole scheme abortive. A syndicate to build a railway in place of the road was formed, proposals were put forward in 1836, but rivalry between the European Powers deferred the granting of concessions until 1855, when the Ottoman Government agreed to connect Istanbul with the European system.

1. *Istanbul–Uzunköprü*

The construction of railways in European Turkey, then far more extensive than now, was begun shortly before the Russo-Turkish War of 1877–8, in order to strengthen the military position of Turkey in the 'vilâyet of the Tuna' (Danube), now Bulgaria. An offer by the Austrian financier, Baron Hirsch, was accepted. In granting the concession the Ottoman Government was not concerned in promoting the economic development of the country, but was guided solely by

strategy. It wished to be independent of sea-transport for the movement of troops outside the Bosporus and Dardanelles. With the same object, concessions were granted to extend the *Chemins de Fer Orientaux* (Istanbul–Sofia–Belgrade–Vienna) to Dedeağaç—now Alexandroupolis—on the Thracian coast, whence a line was built to Salonika, where it was linked with the railways to Bitolj (Monastir) and Skoplje (Üsküb).

In actual fact too little progress was made to have any effect on the Russo-Turkish campaign, and it was only after the war that through rail communication with Bulgaria and Turkish Macedonia was gradually completed. Not till 12 August 1888 did the first train leave Vienna for Istanbul.

The *Chemins de Fer Orientaux* were originally under Austrian control throughout their entire length. The Serbian, Greek, and Bulgarian Governments gradually acquired the sections within their territories, one of the last large transfers taking place shortly before the War of 1914–18. On 1 January 1937 Turkey bought up the section within her own borders, though this amounts to only 209 miles (336 km.) of the original line, including the branch line to Kirklareli.

This section runs the length of Turkey in Europe from Istanbul by Çatalca, Çorlu, and the Ergene river to Uzunköprü. North-west of this important place, at Kuleliburgaz, it crosses the Meriç (Maritsa) into Greek territory, but re-enters Turkey for a few miles near Karaağaç on the right bank of the Meriç, opposite Edirne. An important branch line runs from Mandira, about 22 miles (35 km.) east of Uzunköprü to Kirklareli (Kirk Kilisse), at the base of the Istranca Dağ. The old line to Dedeağaç (Alexandroupolis) lies in Greek territory.

The railways in European Turkey are often referred to as the 'Şark' railways. The word means 'east', a relic of the old name, 'Chemins de Fer Orientaux', and is obviously now misleading from the Turkish standpoint. The line is described below as Railway No. 1, pp. 262–8.

2. *Izmir–Aydin–Eğridir*

In July 1856 the Ottoman Government granted to Britain, in recognition of the help received during the Crimean War, the concession for 50 years to build and manage a railway from Smyrna (Izmir) to Sarayköy in the Büyük Menderes valley. The Government guaranteed an interest of 6 per cent. on the capital outlay, with a

maximum annual payment of £T72,000. The original concession was subsequently altered, and construction proceeded slowly, but steadily, Aydin being reached by the railway in 1866, Sarayköy in 1882, and Dinar in 1889. The extension to this point, as well as important branch-lines, was included in the later concessions. A new contract was made in 1888, the guaranteed interest disappearing and a clause being inserted stating that the Government would buy back the line for £3,000,000 sterling at the expiry of the concession in 1906. When the time came, however, the Ottoman Government was unable to find the money and the company obtained an extension of the concession to 1950 for the whole system serving the fertile valleys of the Büyük Menderes and Küçük Menderes. The lines have always been important, for they link these two valleys to their natural outlet at Izmir, and they have always carried good freights of cereals, tobacco, cotton, and fruit.

The ascent to the plateau begins a little east of Sarayköy, and here the line was expensive because of the number of engineering works. The company hoped to link the line to the Anatolian Railway at Afyonkarahisar, but French interests in the 'Smyrna–Kassaba' line to the north forestalled them. The terminus remained at Dinar, with a branch line to Çivril, from 1889 to November 1912, when the extension to Eğridir was opened.

On the outbreak of war between Britain and Turkey the railway was seized by the Turks in November 1914, but it was formally restored to the company in February 1919, though 186 miles of it were held by Turkish Nationalists until November 1922. Thereafter the company worked to put the line into repair again, and the whole of it was in good order when finally sold to the Turkish Government on 1 June 1935 for £1,825,840 Turkish Debt 7½ per cent. Bonds 1935, redeemable over forty years. A holding company (The Ottoman Holding Company Ltd.) was formed in September 1936 to take over and manage the remaining assets of the old company.

Details of these lines are given below as parts of Railways 17 and 18, pp. 330–8.

3. *Izmir–Turgutlu–Afyonkarahisar*

4. *Manisa–Bandirma*

These two lines originally made up the railway known as the *Chemin de Fer Smyrne–Cassaba et Prolongement.*

In 1863 the British obtained the concession for a railway from Smyrna to Kassaba (Izmir to Turgutlu), 58 miles (93 km.) long, which

was completed in three years. The Government guaranteed 5 per cent. on capital employed, totalling £T800,000. An extension to Alaşehir built by the Government in 1870 was handed over to the British company for control and management. The whole was purchased by a French company in 1893 and an additional concession was secured by this company to extend it to Afyonkarahisar and to manage the railways for a period of 99 years.

The main line serves the fertile Gediz valley as far as Alaşehir, and then climbs to the plateau, where, at Afyonkarahisar, junction is made with the old Anatolian Railway.

From Manisa, in the Gediz valley, an important branch line up the Kum Çay to Soma in the Bakir valley was opened in 1890, and extended by Balikesir to Bandirma on the Sea of Marmara in 1912. This line has now become of great strategic importance, as it links the port of Izmir with the defence centre for the Asiatic shores of Marmara; this importance has been increased by the building of the new line from Balikesir to Kütahya (p. 251).

The Ottoman Government took over control of both lines during the War of 1914–18, but handed them back to the French company when the war was over. In 1920, during the War of Independence, the Nationalists held the main line from Afyonkarahisar to Uşak, later lost it, and finally recaptured it. Both railways were returned to the French company at the time of the Treaty of Lausanne in 1923, but were finally sold to the Turkish State in March 1934.

A full description of the two lines is given on pp. 316–27 (Railways 14, 15).

5. *Mudanya–Bursa*

This is a short railway (gauge 1·05 m.), leading from the Sea of Marmara inland for 25 miles (41 km.). It was one of two projects initiated by the Ottoman Government in an attempt to end foreign railway concessions, and so reduce the heavy financial burdens that were being incurred by the State. Work was begun in 1875, but lack of capital held up construction after nearly a quarter of a million pounds had been spent. An offer by a French group to finish and exploit the line was then accepted, and in 1891 a concession for 99 years was granted.

The line was worked by the *Compagnie Ottomane du Chemin de Fer de Moudanie–Brousse* until 1914, when it was taken over by the Government till after the war. It was finally transferred to the Turkish State in 1931.

It is not connected to the Turkish State Railways net and is of different gauge.[1] Its main object is to serve an agricultural region rich in vines, olives, mulberries, and corn; but it has also some strategic value.

A description of the line is given on p. 315 (Railway 13).

6. *Mersin–Adana*

The Mersin–Adana railway has undergone even more vicissitudes and changes of ownership than those previously described. The original concession was granted for 50 years in January 1883 to two Ottoman subjects; but it was purchased almost at once by an Anglo-French syndicate, by whom the line was built and opened for traffic in 1886. In 1906 it became almost exclusively German when the Deutsche Bank, on behalf of the 'Baghdad Railway', bought up most of the shares. Between that date and the outbreak of war in 1914 the old rolling-stock was entirely replaced by German locomotives, trucks, and carriages, similar to those on the Baghdad Railway, and the permanent way was reconstructed with metal sleepers instead of wooden ones.

The railway serves the Seyhan lowland. The last 14 miles, between Yenice and Adana, form part of the track of the so-called 'Baghdad Railway'. During the War of 1914–18 it was reliably reported that the metals between Mersin and Tarsus were removed for the repair of overworked lines elsewhere. If this was so, it appears to have been temporary, for soon after the war ended, this line, together with the 'Baghdad Railway' from Pozanti in the Taurus to Nusaybin, its eastern terminus, was taken over by a French company, the *Société d'Exploitation des Chemins de Fer Bozanti–Alep–Nissibine*. On 5 January 1928 the line from Mersin to Adana was bought by the Turkish Government, since when it has formed part of the Turkish State Railways. It is of both economic and strategic importance, and was used for the import of railway material through Mersin for the construction of the line from Fevzipaşa to Diyarbekir; with the development of Mersin as a port it will be even more valuable. But before it can be fully used it should be double-tracked.

A description of the line from Mersin to Yenice is given on pp. 338–40 (Railway 19); the section Yenice–Adana is described on p. 299, as part of the line from Konya to Aleppo (Railway 9).

[1] A project has been drawn up to convert the line to normal gauge and link it to the net. Most of the survey was completed in 1941, but no work had been begun in that year (p. 256).

7. *Haydarpaşa–Eskişehir–Konya*
8. *Eskişehir–Ankara*

These two lines together form the original 'Anatolian Railway', which provided the main link between European Turkey and the Anatolian plateau. It is significant of the change of outlook in modern Turkey that, whereas in the days of the Ottoman Empire, with its capital at Istanbul, the main line of the Anatolian Railway ran from Haydarpaşa to Konya, with Ankara the terminus of a branch line from Eskişehir, to-day the line from Ankara to Haydarpaşa reaches out from the heart of the Republic, and Konya is no longer regarded as the important starting-point of the 'Baghdad Railway'.

The history of this line is of great interest and importance, for it marked the beginning of German influence in the Middle East. The line originated, however, in a resolve of the Ottoman Government to construct a railway solely with its own resources. With the assistance of European engineers, construction was begun in 1871, and two years later the section from Üsküdar (Scutari) to Izmit, 57 miles, was completed. Financial difficulties then intervened, and in 1880 a British group took up the extension towards Eskişehir, the Ottoman Government reserving the right to re-purchase the line at any time. This right was exercised in 1888, and the concession passed to a company, incorporated on 16 March 1889 under the name *Société du Chemin de Fer Ottoman d'Anatolie*, which was financed by a combination of German banks. This company secured the concession to build the line through Eskişehir to Ankara (486 km.). Work was begun at once and the railway was completed in 1892. The following year a further concession was obtained by the same interests for a line from Eskişehir to Konya and for one from Ankara to Kayseri. These were to be alternative jumping-off lines for a railway to the head of the Persian Gulf. The first was completed in 1896, but the second was not undertaken until after the founding of the Republic.

These transactions mark not only the obscure origin of the Turkish State Railways, however far they may seem to be removed from present-day railway practice in Turkey, but also the beginnings of German intervention in Turkish affairs. The guarantee obtained by German interests was entirely different from that granted to the British and French. Instead of a guaranteed rate of interest on capital expenditure, which was the security granted for lines leading inland from Izmir, an annual payment per kilometre of track was guaranteed to the Anatolian Railway Company. It is claimed by the

Turks, with good reason, that the arrangement of the 'kilometric guarantee' led to useless detours of the line in order to avoid expensive engineering works, and that it operated entirely to the disadvantage of the State. It is certain that it laid a heavy financial burden on the country, for the long line was largely unproductive; and this excessive burden, coupled with various diplomatic difficulties, held up all further railway construction from 1896 to 1902.

The financial stranglehold obtained by the Germans through this concession enabled the Anatolian Railway Company to secure other favours. At Afyonkarahisar a junction was laid in for the occasional movement of rolling-stock to the 'Smyrna–Kassaba' line, though no regular exchange took place until the transfer of the latter to the Turkish State in 1934. The company also secured in 1899 the concession for constructing, fitting up, and controlling the port of Haydarpaşa; while in 1909 it obtained the rights to irrigate the Konya plain, for which purpose it formed a separate company. But all this was subordinate to the one objective, to secure the concession to build the Baghdad Railway and to extend the influence of Germany to the head of the Persian Gulf. Details of these lines are given below in Railways 2, 3, and 8 (pp. 268–77, 289–93).

9. *Konya–Aleppo–Nusaybin* (*The 'Baghdad Railway'*)

During this period, from 1896 to 1902, two projects for the continuation of the railway to Mesopotamia were considered. The first was for a line from the existing terminus at Konya across the Taurus, joining the Mersin–Adana railway in the Seyhan plain, and crossing the Amanus range and the Euphrates to Nusaybin, Mosul, and Baghdad. The second was from Ankara by Sivas, Harput, and Diyarbekir to Mosul and Baghdad. The Russians opposed the construction of a line through Sivas, though this alinement was favoured by Turkey. The greater commercial and immediate strategic advantages of the route by the south coast, with a branch to Iskenderon, carried more weight with the Germans, in spite of the higher costs of construction.

The concession for the Baghdad Railway was granted to the Anatolian Railway Company in 1902 and modified in April 1903 when the *Société Impériale Ottomane du Chemin de Fer de Baghdad* was formed. This company took over certain French interests and bought the Anglo-French line from Mersin to Adana. The concession was for a line starting from Konya and was for 99 years; it

included the rights to construct ports at Baghdad and Basra, and to terminate the line on the Persian Gulf.[1]

During the years that followed until the outbreak of war in 1914 various sections of the line were completed, and the whole of it from Konya to Resülayn (Ras el 'Ain) was in use during the war except the two difficult sections across the Taurus and Gâvur (Amanus) mountains. The first was not finished until 1918, owing to the large amount of rock-cutting and tunnelling involved, while the Amanus tunnel also was not completed until late in the war. Supplies and reinforcements for the Turkish armies on the two fronts, Palestine and Mesopotamia, were almost entirely dependent throughout the war on the single-track Anatolian and Baghdad railways; they had to cross these two formidable sections, at first by indifferent roads, afterwards metalled, and later by trucks in half-finished tunnels, an operation that seriously hampered the forces in the field (I, p. 307). British and Indian prisoners of war were employed on construction work and the through line to Nusaybin was opened late in 1918.[2]

An important branch of the 'Baghdad Railway' was the Toprakkale–Alexandretta (Iskenderon) line. This is 37 miles long and was opened for traffic in 1913. The line skirts the eastern shore of the Gulf of Alexandretta, and with the exception of its most northerly section, lies exposed to direct attack from the sea. It is said that this consideration led the promoters of the Baghdad Railway to choose a more inland route for the main line, despite the fact that Iskenderon is the natural outlet for traffic from northern Syria.

Another branch line of possible future importance is that from Derbesiye to Mardin (p. 257).

On the conclusion of hostilities, the Iraqi section of the railway between Baghdad and Samarra, with the extension to Baiji and the other lines in Iraq built by the British during the war, was taken over by the British civil administration in Iraq. The 'Anatolian' and 'Baghdad' railways from Haydarpaşa to Pozanti passed to Turkey.[3]

[1] A series of Anglo-Turkish and Anglo-German agreements was signed or initialed between 1908 and 1914 with the object of maintaining the long-established British position and interests in lower Mesopotamia. Among other conditions it was agreed that the terminus of the Baghdad Railway should be at Basra and not on the Persian Gulf coastline, and that the construction and exploitation of the ports of Baghdad and Basra were to be renounced by the railway company in favour of a Turkish company. British navigation rights on the Tigris and Euphrates were also confirmed.

[2] For the subsequent connexion between this line and the Iraq State Railways, *see* below, p. 251.

[3] While the negotiations for the Treaty of Lausanne were proceeding (signed on

France occupied Syria and Cilicia, and from Pozanti onwards the railway to Nusaybin, including the Mersin–Adana and the Toprakkale–Alexandretta lines, came under French control, to be managed by a new company, the *Société d'Exploitation des Chemins de Fer Bozanti–Alep–Nissibine*. Sections of the ceded line were gradually acquired again by treaty or purchase by the Turkish State; and on 1 July 1933, when the French company was finally liquidated, the rest of the line in Turkish territory passed to Turkish control. The chief results of the new agreement were the following: (i) the section to Fevzipaşa became part of Turkish State Railways; (ii) the sections of the railway and its branches in Turkish territory (viz. Toprakkale–Payas, Fevzipaşa–Meydaniekbez, and Çobanbey–Nusaybin) were taken over by a company, the *Cenubi Demiryollari*, or *Société Turque des Chemins de Fer du Sud de la Turquie*, under Turkish legislation but with French capital.[1] (iii) The operation of the remainder, which was in Syrian territory (viz. Payas–Iskenderon, Meydaniekbez–Aleppo–Çobanbey, and Nusaybin–Tel Kochek), was taken over by a new Syrian company formed under French legislation, the *Lignes Syriennes de Baghdad*; but since the transfer of the Hatay to Turkey in 1939, the branch section Payas–Iskenderon has been taken over by the Turkish State. The lines are described below as Railways 9 (pp. 293–302), 20 (pp. 340–1), and 21 (pp. 342–5).

10. *Erzurum–Sarikamiş–the Russian Border*

This line is in two sections of different gauge and was built as a strategic frontier railway by the Russians. The section from the border to Sarikamiş was laid as a branch line of the Russian Trans-Caucasus railway from Tiflis to Tabriz, leaving the main line near Leninakan (formerly Aleksandropol) and passing through Kars. It is Russian broad-gauge (1·524 m.), the section inside Turkish territory being about 76 miles (123 km.) long.

The rest of the line, from Erzurum to Sarikamiş, 108 miles (174 km.)[2]

24 July 1923) the foreign companies, whose lines had been taken over by the Nationalists during the War of Independence (the Anatolian, Baghdad, and part of the Smyrna–Kassaba lines), applied to retake possession. This appeal was granted to the French company, but not to the Anatolian and Baghdad companies, whose lines were retained by the State by legal purchase.

[1] The line is sometimes referred to in English reports as the 'Cenup Railway', sometimes as the 'South Turkish Railway'.

[2] The total distance of the two lines, 297 km., within Turkish territory is 59 km. short of the distance taken over from the Russians for the reasons given in the footnote on p. 240.

is only a narrow-gauge (0·75 m.) military railway, completed by the Russians in 1916. (For the list of stations on these lines, *see* Railways 24, 25, pp. 356–8.)

Railways built since 1923

It must be clear from the foregoing account that there was little uniformity, except in gauge, in the railway system of Turkey at the founding of the Republic. There was the long single-track Anatolian–Baghdad line from Haydarpaşa, rising to the plateau at Eskişehir, skirting its western border by Afyonkarahisar and Konya, descending through the Taurus to the Seyhan plain, passing out by Meydaniekbez to Aleppo and back by Çobanbey, to run along the southern boundary to Nusaybin: a railway by itself of no possible economic use, of very little strategic use, and possibly of some danger to the new Turkey. This was attached by a single line from Eskişehir to the new capital at Ankara. From Afyonkarahisar a line descended from the plateau by Uşak and Turgutlu to the port of Izmir, and a line from Yenice led to the port of Mersin. Manisa was connected through Balikesir to Bandirma.

Ankara was therefore linked to the Bosporus at Haydarpaşa, to the Sea of Marmara at Bandirma, to the Aegean at Izmir, to the Mediterranean at Mersin. None of these lines took the shortest route and all were single-track with no alternatives. There was no connexion between Ankara and Sivas, and none from the plateau to the Black Sea. The line from Izmir through Aydin ended aimlessly at Eğridir. The lines in the extreme east were of different gauges.

The task of the Turkish Government was

(1) To link together eastern and western Turkey, by joining up the important centres on the plateau, Eskişehir, Ankara, Kayseri, Sivas, Erzurum.
(2) To acquire all foreign-controlled lines by purchase or treaty and weld them together into a single system under State management.
(3) To tie the plateau more directly to the Sea of Marmara and the Aegean.
(4) To link the populous Black Sea coast, with its minerals and other economic products, to the plateau.
(5) To open up communication with both Iraq and Persia.
(6) To bind these various lines together to form a comprehensive net, from which additional lines and good roads could radiate.

This task was to be accomplished with the State's own resources, and without resort to foreign finance.

By 1937 all lines in the country were under the control of the State. The Kütahya–Balikesir line linking the plateau more directly to Marmara and the Aegean was completed in 1932. The Samsun–Kalin and Zonguldak–Irmak railways, uniting the Black Sea to the plateau railway, were finished in 1932 and 1937 respectively. The through railway to Erzurum was opened on 20 October 1939. The old Baghdad railway was completed across the extreme north-east corner of Syria to Mosul in Iraq in 1940, and another line from Diyarbekir is being extended through Kurtalan to Iraq.

The table overleaf summarizes the progress of railway construction between 1923 and 1939 and gives the dates of completion of sections of the various lines (distances are in kilometres).

New Railways in the West

1. *Kütahya–Balikesir*

Kütahya, the chief town of the vilâyet of that name, was already the terminus of a short branch line from Alayunt on the Anatolian railway between Eskişehir and Afyonkarahisar. The new line makes use of the Balikesir depression eastwards towards the plateau and opens up a valuable mining and agricultural region. It also forms a direct and important link between the plateau and the Manisa–Bandirma railway at the strategic centre of Balikesir, thus serving the defence of the Aegean and Marmara coasts. (For topography and details *see* Railway 16, pp. 327–30.)

2. *Afyonkarahisar–Karakuyu, Baladiz–Burdur, and Bozanönü–Isparta*

The first of these binds the old Izmir–Aydin–Eğridir line at Karakuyu to the Anatolian railway, thereby making a third link in the west between the plateau railway system and the Aegean coast, and stressing the importance of the route by the Büyük Menderes. The link doubles the capacity to reinforce the south-west defence sector facing the Dodecanese. (*See* Railway 17, pp. 330–7.)

The Baladiz–Burdur line is the first section of a railway which will eventually link the plateau railway net to the Mediterranean coast at Antalya; at present the latter is joined to Burdur by a motor-road with a bus service. The Isparta line joins the chief town of the

Railway Completion 1923–39

Railway	*Section*	*1925*	*1926*	*1927*	*1928*	*1929*	*1930*	*1931*	*1932*	*1933*	*1934*	*1935*	*1936*	*1937*	*1938*	*1939*	*Total distance, Km.*
1. KÜTAHYA–BALIKESIR (252 km.)	Kütahya–Tavşanli	..	..	..	..	50	..	..	..	..	..	..	..	..	..	..	252
	Tavşanli–Değirmisaz	..	..	..	..	..	39	..	..	..	..	..	..	..	..	..	
	Değirmisaz–Balikesir	..	..	..	..	..	..	..	163	..	..	..	..	..	..	..	
2. AFYONKARAHISAR–KARAKUYU and branches. (150 km.)	Afyonkarahisar–Karakuyu	..	..	..	..	..	..	..	..	..	..	..	113	..	..	..	150
	Baladiz–Burdur	..	..	..	..	..	..	..	..	..	..	..	24	..	..	..	
	Bozanönü–Isparta	..	..	..	..	..	..	..	..	..	..	..	13	..	..	..	
3. ANKARA–SIVAS–MALATYA (855 km.)	Ankara–Yerköy	203	..	..	..	..	..	..	..	..	..	..	..	..	..	..	855
	Yerkoy–Kayseri	..	..	177	..	..	..	..	..	..	..	..	..	..	..	..	
	Kayseri–Sivas	..	..	..	..	..	222	..	..	..	..	..	..	..	..	..	
	Sivas–Tecer	..	..	..	..	..	..	..	..	..	..	43	..	..	..	..	
	Tecer–Çetinkaya	..	..	..	..	..	..	..	..	..	..	..	70	..	..	..	
	Çetinkaya–Hekimhan	..	..	..	..	..	..	..	..	..	..	..	..	70	..	..	
	Hekimhan–Malatya	..	..	..	..	..	..	..	..	..	..	..	70	..	..	..	
4. ÇETINKAYA–ERZURUM (437 km.)	Çetinkaya–Divrik	..	..	..	..	..	..	..	..	..	..	..	..	66	..	..	437
	Divrik–Erzincan	..	..	..	..	..	..	..	..	..	..	..	..	..	159	..	
	Erzincan–Erzurum	..	..	..	..	..	..	..	..	..	..	..	..	..	..	212	
5. KARDEŞGEDIĞI–BOĞAZKÖPRÜ (172 km.)	Kardeşgediği–Boğazköprü	..	..	..	..	..	..	..	..	172	..	..	..	..	..	..	172
6. IRMAK–FILYOS–ZONGULDAK (415 km.)	Irmak–Çankiri	..	..	..	..	..	..	102	..	..	..	..	..	..	..	..	415
	Çankiri–Eskıpazar	..	..	..	..	..	..	..	..	..	..	151	..	..	..	..	
	Eskipazar–Balikisik	..	..	..	..	..	..	..	..	..	65	..	..	..	..	..	
	Balıkisik–Filyos	..	..	..	..	..	71	..	..	..	..	..	..	..	..	..	
	Filyos–Zonguldak	..	..	..	..	..	..	..	..	..	..	..	16	10	..	..	
7. KALIN–SAMSUN (378 km.)	Kalin–Kunduz	..	..	..	..	..	..	..	102	..	..	..	..	..	..	..	378
	Kunduz–Zile	..	..	..	..	..	61	..	..	..	..	..	..	..	..	..	
	Zile–Amasya	..	..	..	82	..	..	..	..	..	..	..	..	..	..	..	
	Amasya–Kavak	..	..	86	..	..	..	..	..	..	..	..	..	..	..	..	
	Kavak–Samsun	..	47	..	..	..	..	..	..	..	..	..	..	..	..	..	
8. FEVZIPAŞA–DIYARBEKIR and YOLÇATI–ELÂZIZ (528 km.)	Fevzipaşa–Golbaşi	..	..	..	..	138	..	..	..	..	..	..	..	..	..	..	528
	Gölbaşi–Doğanşehir	..	..	..	..	..	56	..	..	..	..	..	..	..	..	..	
	Doğanşehir–Malatya	..	..	..	..	..	..	56	..	..	..	..	..	..	..	..	
	Malatya–Firat	..	..	..	..	..	..	..	33	..	..	..	..	..	..	..	
	Firat–Yolçati	..	..	..	..	..	..	..	..	..	63	..	..	..	..	..	
	Yolçati–Diyarbekir	..	..	..	..	..	..	..	..	..	..	158	..	..	..	..	
	Yolçati–Elâzız	..	..	..	..	..	..	..	..	..	24	..	..	..	..	..	
		203	47	263	82	188	449	158	298	172	152	352	306	146	159	212	3,187

vilâyet of that name to the railway net. (Branch lines of Railway 18, pp. 337–8.)

New Railways across the Anatolian Plateau

3. *Ankara–Kayseri–Sivas–Çetinkaya–Malatya*

This is the main extension of the old Anatolian railway, from Ankara eastwards across the plateau. As far as the Kizil Irmak the line was laid out during the War of 1914–18, and though reports were received of construction, little appears to have been finished, probably owing to lack of material.

The course of this railway is shown incorrectly on some maps. It does not follow the valley of the Kizil Irmak, but crosses the river at mile 45 (km. 72), and traverses the plateau, making directly for Kayseri, and forming a chord of the circle of which the Kizil Irmak is the south-western arc. From Kayseri the line turns north-east, ascends the Kizil Irmak through poor barren country much exposed to wind, and reaches Sivas, so important in the history of the resurgence of Turkey. From here the railway again turns south-east and heads for Malatya and the Euphrates.

This railway should be looked upon as one of the main trunk lines of Turkey. (*See* Railways 4–6, pp. 278–85, and 23, pp. 354–6.)

4. *Çetinkaya–Divrik–Iliç–Erzincan–Erzurum*

This railway, only completed to Erzurum since the outbreak of the present war in 1939, leaves the trunk line just described at Çetinkaya, and follows the valley of the Kara Su (Euphrates) to Erzurum, where it meets the old Russian narrow-gauge line from Sarikamiş (*see* above, p. 249). Erzurum is connected by important roads to Trabzon on the Black Sea and to other centres in eastern Turkey and Persia. (*See* Railway 7, pp. 285–8.)

The lack of this railway, and indeed the poverty of all communications in this area, during the War of 1914–18, was a serious handicap to the Turks in their campaign with Russia (I, p. 306), and the new line is of considerable strategic importance.

It has been proposed to convert the rest of the line from Erzurum to Leninakan in Soviet Armenia to normal gauge, an operation which would increase the economic value of the whole railway. The section from Sarikamiş to Leninakan was planned to be completed to normal gauge by the spring of 1940; but there is no information that any work has been begun.

5. *Kardeşgediği–Boğazköprü*

This railway, completed in 1933, forms a very important connexion between the old 'Baghdad Railway', near Ulukişla, and the new line from Ankara to Sivas (No. 3 above), near Kayseri. It therefore links the port of Mersin and the Seyhan plain in the south directly with Ankara and Sivas on the plateau, thus saving the long detour by Konya and Eskişehir. With the lines noted below it forms direct connexion from the Mediterranean to two points, Zonguldak and Samsun, on the Black Sea coast.

Since the completion of this line, the Taurus Express has taken the route Haydarpaşa – Eskişehir – Ankara – Boğazköprü – Kardeşgediği–Adana–Aleppo, in preference to the route by Afyonkarahisar and Konya. The express runs (in peace-time) three times a week each way in conjunction with the Simplon–Orient Express. (*See* Railway 10, pp. 302–4.)

Black Sea Coast Connexions

6. *Irmak–Filyos–Zonguldak*

The railway to Filyos forms the most direct communication between Ankara and the Black Sea, whence an extension along the coast to Zonguldak was completed in 1937. The line is being extended to Ereğli. It passes through superb scenery as it crosses the coastal ranges, and has several engineering masterpieces. Besides opening up the coast in the Filyos neighbourhood as a holiday resort, the railway serves the Ereğli–Zonguldak mines, the chief source of Turkish coal, and puts this coal at the disposal of the whole country served by the railway net. (*See* Railway 11, pp. 304–11.)

7. *Kalin–Samsun*

This railway, leaving the plateau trunk line 15½ miles (25 km.) west of Sivas, is the most direct connexion between Sivas and the Black Sea coast at Samsun. It serves the fertile country round Amasya, and, with feeder roads, the irrigated country of the Yeşil Irmak. A narrow-gauge line links Samsun to Çarşamba, and a good coastal motor-road east and west of Samsun, now almost completed, will serve the whole of the coast. (*See* Railway 12, pp. 311–15.)

South and South-eastern Turkey

8. *Fevzipaşa–Malatya–Diyarbekir, and Yolçati–Elâziz branch-line*

The original reason for this line was the strategic need of a line in south-eastern Turkey farther from the Syrian border than the existing

'Baghdad Railway' to Nusaybin. It leaves the latter at Fevzipaşa, before that line turns south to the Syrian boundary near Meydaniekbez on its way to Aleppo, and strikes north-east to Malatya and the Euphrates, which it crosses by a fine modern bridge. From here it crosses the Euphrates–Murat watershed, passes Yolçati, whence a short but important branch line leads to Elâziz, skirts the Gölcük Lake, follows the upper gorge of the Tigris, and meets this river again at Diyarbekir. It serves the copper-mines of Erganimadeni, and for this reason is sometimes called 'the Copper Line'. (*See* Railway 22, pp. 345–54.)

RAILWAYS NOT COMPLETED IN 1941

The following lines were under construction in 1942:

Black Sea Coast

Zonguldak–Ereğli. Work was begun on this line in 1938 and was to have been completed by the end of July 1942. The amount of tunnelling required delayed progress, and by the end of 1941 the small section of 3 miles between Zonguldak and Kozlu was not open to traffic. A few details of this section are given in the description of Railway 11 (p. 306). Reports on work between Kozlu and Ereğli are not available.

South-east Turkey

Diyarbekir–Kurtalan–Cizre. This is the extension to the Iraq frontier mentioned above (p. 251). The section to Bismil was completed in 1940, but from here heavy tunnelling through the Kira Dağ and other engineering works were necessary, and the line to Kurtalan is not expected to be open before the end of 1942. From Kurtalan to Cizre the line is surveyed, but no work has been reported (June 1942). For further details, *see* Railway 26, pp. 358–60.

Eastern Turkey

Elâziz–Van–Persian Frontier. In August 1941 work on the section Elâziz–Palu, 42·9 miles (68·1 km.), had begun, and contracts for that between Palu and Çapakçur, 40·1 miles (64·6 km.), had been placed. Work on the line to Palu was expected to be finished by April 1943, on that to Çapakçur not before the end of that year. The Muş–Tatvan section is surveyed, but no work has been reported. A train ferry will cross Lake Van, beyond which the alinement is not yet fully surveyed. For further details, *see* Railway 27, pp. 361–3.

PROJECTED RAILWAYS

Various proposals for new lines have been discussed, but decisions regarding immediate additions to the network are not available. The following are the most important projects, and some have been surveyed.

Black Sea Coastlands

(i) *Adapazari–Bolu–Ismetpaşa–Tosya–Osmancik–Amasya.* The whole line has been surveyed. It is proposed to extend the survey to some point on the Çetinkaya–Erzurum railway; the route suggested is by the Kelkit valley by Erbaa, Niksar, Reşadiye, Kelkit, Bayburt to Erbaş (km. 335·3 from Çetinkaya). If completed this line would shorten the journey from Haydarpaşa to Erzurum by 250 miles.

(ii) *Çarşamba–Terme.* A narrow-gauge extension to the Samsun–Çarşamba line was projected in 1938, but no work is yet reported to have been begun.

Western Anatolia

(iii) *Okçugöl–Bursa–Bozüyük.* This is a project for a normal-gauge line, involving the conversion of the metre-gauge line from Mudanya to Bursa to normal and its continuation to Bozüyük at mile 164 (km. 263·3) on the Haydarpaşa–Eskişehir railway. The survey from Bursa by Inegöl to Bozüyük was completed by 1941; that for a branch line from Okçugöl, on the Balikesir–Bandirma railway, to Bursa was in progress.

(iv, v) *Çanakkale–Okçugöl* and *Inegöl–Yenişehir.* These are two projects which have not yet reached the survey stage. It is unlikely that any work will be undertaken in the near future.

Southern Coastlands

(vi) *Burdur–Antalya.* This line has long been projected; it has been surveyed, but no construction work has yet been reported. It would form an important second link with the Mediterranean and would greatly help the development of the Antalya lowland.

(vii) *Eğridir–Konya.* No survey of this line has yet been reported, though it is shown on some Turkish maps as projected. Work on it is unlikely to be undertaken for some time.

Central Plateau

(viii) *Bolu–Ankara.* This line will presumably not be undertaken

until the Adapazari–Bolu line (*see* (i) *above*) is completed. It would shorten the journey from Haydarpaşa to Ankara considerably.

South-east Turkey

(ix) *Diyarbekir–Arada.* The survey of this line between Diyarbekir and Arada (*c.* km. 362 on the Aleppo–Nusaybin railway) has been made, but no decision to construct it has been reached. An alternative project is to link Diyarbekir with Mardin, which is already connected by a branch line from Derbesiye on the Aleppo–Nusaybin line, and the formation for a narrow-gauge line was begun some years ago and then abandoned. A third suggestion to connect Bismil with Mardin is unlikely to be adopted.

(x) *Kurtalan–Siirt–Bitlis.* When the line from Diyarbekir to Kurtalan was originally projected, it was proposed to build a line to Siirt and Bitlis. The Bitlis project has been abandoned, owing to the great difficulties, at any rate for the present, and its place is to be taken by the new motor-road, and by the Elâziz–Palu–Muş–Tatvan–Van line now under construction. A branch line from Kurtalan to Siirt may, however, be undertaken after the line from Kurtalan to Cizre is finished.

Eastern Turkey

(xi) *Erzurum–Muş.* It has been proposed that the Adapazari–Amasya–Erbaş line (*see* (i) *above*), when completed, will be extended from either Erbaş or Erzurum to Muş. Details of the proposed alinement are not available, but such a line would have to make use of the upper Aras or the Kiği river, east or west of the Bingöl volcano, which forms a serious obstacle (*see* panorama, vol. I, fig. 51, p. 191).

Organization and Efficiency

General

The Turkish railway system has ten divisional headquarters: Istanbul (Sirkeci), Haydarpaşa, Ankara, Afyonkarahisar, Kayseri, Erzurum, Balikesir, Izmir, Adana, and Malatya, and a traffic section at Mudanya, all controlled from railway headquarters at Ankara. By a decree of 13 January 1942 a new Transport Commission, with representatives from the General Staff, and from the Ministries of National Defence, of Economy, and of Commerce, was formed under the presidency of the Director-General of State Railways. This Commission has to decide the relative priorities of rail transport according to urgency and importance.

Although the railways are built to European standards, train services are still very limited. This is due firstly to the low density of the population, particularly in undeveloped parts of the country, and to their agricultural pursuits, and then to the shortage of rolling-stock, to the difficulty and expense of increasing it, and to the lack of trained administrative and operating staff. The last is being remedied, but the other causes are more fundamental to the country, and it is difficult to see how any great expansion of the train services can yet be justified.

In normal times two important trains from Haydarpaşa prolong the international service from western and central Europe beyond Istanbul. They are the Taurus Express to Aleppo, run in conjunction with the Simplon-Orient Express, and the Anatolian Express. The former used to take the route through Konya, but now passes through Ankara, Boğazköprü, and Ulukişla; the Anatolian Express runs to Ankara, where it connects with the services to Sivas and Samsun, and to Malatya and Diyarbekir. There is a train ferry across the Bosporus between Istanbul and Haydarpaşa, but it only operates in fair weather and in daylight (p. 270).

These two trunk lines are now the basis of the railway system, and from junctions on it connexion is made to economic centres and to the coast. On very few lines are there more than one or two trains a day in each direction. The railways are, however, efficiently operated with the rolling-stock and material available, and they run well up to time.

Personnel

Administrative and operating staff, though adequate for pre-war civil requirements, would have to be reinforced for any great expansion. The total staff in 1938, including 520 on the line between Çobanbey and Nusaybin, was only 22,063. All were Turkish subjects, excepting a few German technicians employed as engine-drivers and in the Sivas workshops.

Capacity

One of the chief factors limiting the capacity of Turkish railways is the shortage of locomotives and rolling-stock. In the general details of each line described, figures are given for the number of trains that could operate each way in twenty-four hours, but though the practical capacity given is only two-thirds of the theoretical maximum number of goods trains possible in twenty-four hours, there is insufficient

rolling-stock available to operate at the practical capacity, and the actual capacity is limited in every case by the amount of stock available at any particular time on a particular line.

Workshops and Repairs

The main locomotive repair workshops are at Sivas, Eskişehir, Istanbul (Yedikule), Izmir, and Halkapinar (near Izmir). There are subsidiary shops at Ankara, Edirne, Haydarpaşa, Kayseri, and Erzurum; also at Aleppo in Syria for the use of the line to Nusaybin. Engine-sheds are equipped for light running repairs.

The Sivas workshops are the most up to date and the best equipped; they are said to be capable of rebuilding from 120 to 150 engines a year and of turning out 20 new locomotives a year, though there is no evidence that any new locomotives have actually been built.

The Eskişehir shops were the most complete before the Sivas shops were opened, and were originally equipped by the Germans for use on the Anatolian and Baghdad railways (photo. 80). The workshops at Istanbul and Izmir are all small and date from the time when their respective lines were under foreign control.

Fuel and Water

All railways, except those from Erzurum to Sarikamiş and Sarikamiş to Leninakan, are fuelled with coal, almost all of which now comes from the Zonguldak coal-fields. Oil for the lines from Erzurum to Leninakan is imported from the U.S.S.R.

Water is generally adequate, and during periods of drought it is assured by special tanks erected on the plateau at intervals of from 20 to 25 miles.

Detailed Description of Railways

In the following description of the different lines, details have been drawn from various sources. For some, e.g. Railways 11, 22, full details are available from reports issued by the construction engineers. For others, particularly the older lines, details are available, but may not be up to date. For some of the most recently completed lines constructional details are not available, though photographs and notices have appeared in various Turkish and foreign publications. The account of the progress of construction on the new lines (Rlys. 26, 27) is drawn from Turkish reports available to the public.

The description of each line is divided into three parts: (*a*) general details of the line as a whole, distances, branch lines, permanent way,

capacity, &c.; (*b*) general description of the line and the country passed; (*c*) detailed description of station facilities and chief engineering works. In the general description distances are given in miles; in the detailed account they are given in the metric system, which is used by the railway authorities themselves. The distance in kilometres from the starting-point is given in the first column; the station name, the distance to the next passing-loop, and a reference to the port chapter (XII) or town gazetteer (App. B), are shown in the second.

The third column gives the station height and station facilities (abbreviated to save space); details of bridges more than 10 metres long, and of tunnels, where available; remarks on the course of the line and on other points of interest. Some of these details are liable to change and none have been checked on the ground. Sometimes the station names, which have been examined with Turkish time-tables or distance-tables, do not agree with names on maps or with those adopted during the construction of the line; alternative names have therefore been given where possible. It should also be remembered that considerable damage was done during the earthquakes of recent years, particularly those of December 1939; it has not been possible to examine any records of reconstruction since that last catastrophe.

The following abbreviations are used in this last column:

Alt.	Altitude.
ES.	Engine-shed; the type and number of roads is given where available.
Tbl. (20 m.)	Turntable (diameter, 20 metres).
W.	Watering facilities are shown in brackets after the letter W.
(T. 5,000 gls.)	Water tank, capacity 5,000 gallons.
(Cr.)	Water-crane(s).
(SP.) (HP.)	Steam-pump; hand-pump.
(Well)	Well supply.
RpS.	Repair shops for light running repairs.
G.	Goods shed.
Cr.	Crane.
Wb.	Weighbridge.
LP., SLP., ELP.	Loading platform; side-loading platform; end-loading platform.

Secondary tracks are grouped at the end:

MY. (6)	Marshalling yard, 6 roads.
PL.	Passing-loop.

LS.	Loop-siding.
DES.	Dead-end-siding.
Sdg(s).	Siding(s).
(1,320 m.)	The length in metres given in brackets is the total of secondary track, marshalling yards, loops, and sidings. The figure is a guide only, for in some cases the secondary track is believed to be disconnected or out of use.

DETAILED DESCRIPTION OF TURKISH RAILWAYS

European Turkey

1. ISTANBUL–UZUNKÖPRÜ–EDIRNE 262
   (*a*) *Branch*: Mandira–Kirklareli 267

Main Lines

2. HAYDARPAŞA–ESKIŞEHIR 268
3. ESKIŞEHIR–ANKARA 275
4. ANKARA–KAYSERI 278
5. KAYSERI–SIVAS 281
6. SIVAS–ÇETINKAYA 284
7. ÇETINKAYA–ERZURUM 285
8. ESKIŞEHIR–KONYA 289
9. KONYA–ULUKIŞLA–ADANA–FEVZIPAŞA–ALEPPO . . . 293
10. KAYSERI–ULUKIŞLA (BOĞAZKÖPRÜ–KARDEŞGEDIĞI) . . 302

Black Sea Coast Connexions

11. IRMAK–FILYOS–ZONGULDAK 304
12. SIVAS (KALIN)–SAMSUN 311
   (*a*) Samsun–Çarşamba 313

West Anatolian Lines

13. MUDANYA–BURSA 315
14. IZMIR–MANISA–AFYONKARAHISAR 316
15. MANISA–BALIKESIR–BANDIRMA 323
16. BALIKESIR–KÜTAHYA–ALAYUNT 327
17. IZMIR–AYDIN–KARAKUYU–AFYONKARAHISAR . . . 330
18. KARAKUYU–EĞRIDIR 337
   (*a*) Baladiz–Burdur 338
   (*b*) Bozanönü–Isparta 338

South Coast Connexions

19. MERSIN–YENICE 338
20. ISKENDERON–TOPRAKKALE 340

South-east Turkey

21. ALEPPO–NUSAYBIN–TEL KOCHEK 342
22. FEVZIPAŞA–MALATYA–YOLÇATI–DIYARBEKIR . . . 345
23. ÇETINKAYA–MALATYA 354

Eastern Turkey

24. ERZURUM–SARIKAMIŞ 356
25. SARIKAMIŞ–LENINAKAN 357

Under Construction

26. DIYARBEKIR–KURTALAN–CIZRE 358
27. ELÂZIZ–VAN–PERSIAN FRONTIER 361

1. ISTANBUL–UZUNKÖPRÜ–EDIRNE

(*Completed 1888; see page 241*)

Route

Istanbul–Uzunköprü	169·1 miles	272·1 kilometres
Uzunköprü–Edirne	28·7 „	46·2 „
	197·8	318·3

Branch line

(Alpullu)–Mandira–Kirklareli (*see* 1 *a*, p. 267).

Permanent way and stations

Gauge, normal (1,435 mm.). Double track, Istanbul–Yeşilköy (17·7 km.). Single track, Yeşilköy–Edirne (300·6 km.). Rails, 68–78 lb. per yd. (34–9 kg./m.); sleepers, beech. Maximum axle-load, 14–16 metric tons. Minimum radius of curves: 225 m. (outside Istanbul); 250 m. (Maden–Uzunköprü); elsewhere 300 m. Maximum gradient: westwards, 1 in 66, between Kabakça and Çerkeşköy; eastwards, 1 in 66, between Çerkeşköy and Sinekli. Maximum distance between stations, 26 km. Çorlu to Muratli.

Speed and capacity

Overall time (including stops): passenger trains 9 hours; goods trains 16 hours. Capacity of line: 12 trains each way in 24 hours.

Miscellaneous

Marshalling yards at Istanbul, Çerkeşköy, Alpullu, Pythion, Edirne. Locomotive repair shops at Yedikule and Edirne. Engine-sheds at Istanbul, Yeşilköy, Çerkeşköy, Çorlu, Alpullu, Pythion, Edirne, and Kirklareli.

GENERAL DESCRIPTION

On leaving Istanbul the railway skirts the shore of the Sea of Marmara for about 13 miles (21 km.) to the Florya beach, by Küçük Çekmece station. Thence it turns inland to skirt the Küçük Çekmece lagoon and ascends to the crest of the Çatalca Lines near Hadimköy. It descends beyond the Lines, crosses the Karasu valley to Çatalca, and keeps to the broad watershed between the Black Sea and Sea of Marmara to beyond Sinekli, when it descends to the Çorlu valley, which it follows to the junction with the Ergene river. The flat, marshy valley of this river is then taken as far as Uzunköprü, the line crossing a succession of small streams from the north by steel girder bridges. Some of these streams are liable to sudden freshets which have been known to carry away the bridges, particularly in the early days when some of them had lattice-girders below rail-level; almost all girders are now above the line.

From Çorlu onwards the railway keeps south of the Istanbul–Edirne motor-road. Maps are not very accurate and it is difficult to locate some of the smaller streams, possibly because of changes in name.

Near Uzunköprü station the line traverses a low spur into the Meriç (Maritsa) valley, crossing the river by three bridges connected by embankments where it enters Greek territory. It then follows the wide Meriç valley, recrossing into Turkey before reaching Edirne.

A branch line leaves the main line at Mandira, between Alpullu and Pehlivanköy, and runs to Kirklareli (formerly Kirk Kilisse). There are military crossing-places every 15 km. Details of stations and distances are given on p. 268.

DETAILED DESCRIPTION

Km. from Istanbul	*Stations and passing-loops*	*Remarks*
0·0	ISTANBUL (SIRKECI, SIREKLI) (*Port*)	ES.; 7 Tbls.; W. (T. 22,000 gls.; Cr., SP.); G.; Wb.; Trav. Cr.; ELP.; SLP.; MY. and Sdgs. (6,312 m.). Sdg. along quay (p. 67).
2·1	*Cankurtaran*	Halt. Line skirts shore of Marmara.
3·9	KUMKAPI	2 LS. (203 m.).
4·8	*Yenikapi*	Halt.
6·5	*Samatya*	Halt.
7·4	YEDIKULE	Alt. 33 ft. (11 m.). Tbl.; W. (T. 11,000 gls.; Cr., SP.); Main RpS. (between railway and shore); Wb.; several Sdgs. (1,115 m.). Line passes through cutting.

Km. from Istanbul	*Stations and passing-loops*	*Remarks*
8·6	*Balikli*	Halt.
		Girder bridge, 7·5 m. long, carries line over coast road.
9·8	*Zeytinburnu*	Halt.
		Line ascends sharp spur. Country is generally bare and open.
		Bridge over stream.
11·9	*Yenimahalle*	Halt.
12·6	BAKIRKÖY	Alt. 56 ft. (17 m.). Formerly Makriköy. Cattle-ramp; 3 LS. (584 m.).
		3 bridges over streams.
17·7	YEŞILKÖY (4)	Alt. 50 ft. (15 m.). Formerly San Stefano. Small ES.; W. (T. 11,000 gls.; Cr., SP.); cattle-ramp; several Sdgs. (854 m.). Double track ends.
		Line passes over bare country skirting Sea of Marmara.
18·7	..	Bridge over stream.
21·4	*Florya*	Halt. The fine sandy Florya beach stretches down from the station to the shore.
21·6	..	Bridge over stream.
21·9	KÜÇÜK ÇEKMECE (9)	Alt. 33 ft. (10 m.). G.; cattle-ramp; PL. and 2 Sdgs. (607 m.). The Istanbul–Edirne road crosses the line near the station by a masonry bridge. Station at outlet of Küçük Çekmece lagoon.
		The line turns inland following the eastern shore of the Küçük Çekmece lagoon, and curves round the northern shore.
24·0	..	Halt.
		Line crosses two small streams at kms. 26·5 and 27.
30·7	PL. (8)	Alt. 82 ft. (25 m.). PL. (392 m.).
33·5	..	Plate-girder bridge over Taşlu or Sazli stream, length 40 m. (3 × 12 m.), stone piers.
		Line winds over a broad clay spur to ascend valley to north-west.
38·9	ISPARTAKULE (13)	Alt. 50 ft. (15 m.). W. (T. 11,000 gls.; Cr., SP.); G.; SLP.; PL., Sdgs. (671 m.).
		Line crosses Akpinar stream immediately after leaving station and ascends Akpinar valley.
c. 45	..	Girder bridge over Akpinar stream (2 × 9 m.), stone piers.
		Valley narrows and line passes through clay cutting.
51·4	HADIMKÖY (9)	Alt. 341 ft. (104 m.). G.; 2 SLP.; cattle-ramp; PL., several Sdgs. (1,349 m.).
		Line ascends to km. 51·9, then descends sharply to low ground north of Büyük Çekmece lake.
60·5	PL. (11)	Alt. 184 ft. (56 m.). PL. (384 m.).
67·5	..	Girder bridge over Karasu (*class.* Athyras), length 90 m., stone piers.
71·1	ÇATALCA '14) (*Gaz.*)	Alt. 50 ft. (15 m.). W. (T. 11,000 gls.; Cr.); G.; Wb.; SLP.; PL., 2 Sdgs. (935 m.).
		Line ascends Karasu valley, and crosses 3 bridges at kms. 79, 83, and 85.

Km. from Istanbul	*Stations and passing-loops*	*Remarks*
85·5	KABAKÇA (12)	Alt. 187 ft. (57 m.). W. (T. 11,000 gls.; Cr., SP.); G.; Wb.; SLP.; PL., LS. (544 m.).
86·5	..	Girder bridge over Karasu (here called Büyük Eldezen), 24 m. long.
97·8	KURFALLI PL. (10)	Alt. 577 ft. (176 m.). PL. only (404 m.). Line ascends 1 in 66 to crest of watershed between Black Sea and Sea of Marmara, where brushwood and low oak begin to appear.
108·2	SINEKLI (21)	Alt. 725 ft. (221 m.). Station on the watershed. Tbl.; G.; cattle-ramp; Wb.; PL., 2 LS. (914 m.). Near Yiğit hill, alt. 846 ft. (258 m.), the line leaves the broad-ridged watershed, and passing through thickly wooded country of low oak and brushwood, descends 1 in 66 to the Ramazan headstream of the Çorlu river. It passes into cultivated country about km. 122.
129·4	ÇERKEŞKÖY (12)	Alt. 486 ft. (148 m.). ES. (6 roads); Tbl.; 200-ton coal-stack. W. (T. 11,000 gls.; Cr., SP.); G., cattle-ramp; ELP.; PL., MY. (4); several Sdgs. (2,584 m.). Northern road to Saray and Kirklareli, with a branch to Midye on the Black Sea, leaves the railway here (p. 374).
131·5	..	Lattice-girder bridge over Çorlu stream, 36 m. long (6 × 6 m.). Line descends open Çorlu valley, on right bank of stream.
132	..	Bridge.
136·5	..	Line crosses to left bank of Çorlu stream by a girder bridge, 40 m. long.
140	..	Bridge.
141·6	VELIMESE PL. (12)	Alt. 427 ft. (130 m.). PL. only (199 m.).
153·9	ÇORLU (26) (*Gaz.*)	Alt. 377 ft. (115 m.). ES. (2 roads); Tbl.; W. (T. 11,000 gls.; Cr., SP.); G.; SLP.; cattle-ramp; PL., several Sdgs. (1,265 m.). Istanbul–Edirne motor-road crosses the line here. Country is open and undulating. Line descends Çorlu valley, crossing bridges at km. 164, 167, 172, and 173.
178	..	Line crosses Çorlu stream by lattice-girder bridge, 60 m. long (5 × 12 m.), stone piers.
179·8	MURATLI (15)	Alt. 269 ft. (82 m.). Tbl.; G.; cattle-ramp; 2 SLP. (30 m., 300 m.); PL., 3 Sdgs. (2,264 m.). Muratli is an important road-rail junction: the motor-road between Tekirdağ (formerly Rodosto), on the Sea of Marmara, and Büyük Karıştıran on the Istanbul–Edirne road crosses the railway at this point. Line enters Ergene valley, which it follows to Uzunköprü.

Km. from Istanbul	*Stations and passing-loops*	*Remarks*
183	..	Lattice-girder bridge over Ergene, 36 m. long (3 × 12 m.), stone piers. River is liable to sudden rises.
187	..	Bridge.
195	..	Lattice-girder bridge over Ergene, 48 m. long (4 × 12 m.), stone piers.
195·7	SEYITLER (17)	Alt. 193 ft. (59 m.). W. (T. 3,500 gls., HP.); G.; PL., LS. (1,103 m.).
212	..	Lattice-girder bridge over Ergene, 153 m. long.
213·3	LÜLEBURGAZ (5) (*Gaz.*)	Alt. 157 ft. (48 m.). Tbl.; G.; SLP.; cattle-ramp; several Sdgs. Town is about 7 km. to north of station, and connected by motorable road.
215·5	..	Line crosses 2 lattice-girder single-span bridges over Burgaz stream.
218	SARICAALI PL. (12)	PL. only (230 m.).
229	..	Line crosses 2 lattice-girder bridges over Neylan stream and skirts undulating ground with marsh and meadow a mile wide.
230·0	ALPULLU (10)	Formerly Babaeski junction (for Kirklareli). Alt. 111 ft. (34 m.). ES. (dead-end, 2 roads); W. (T. 11,000 gls.; Cr., SP.); Tbl.; G., Wb., cattle-ramp; 2 SLP.; PL., MY. (5 roads, 1,614 m.). Beyond the station the valley is flat and marshy with deep black soil, the streams being deep and sluggish with reeds along the banks. Numerous small streams running into the Ergene are crossed, generally by lattice-girder bridges. The most important are the three over the Babaeski streams about km. 237: lengths 28 m. (3 spans), 13·5 m. (1 span), and 14·9 m. (1 span); all are on stone piers.
240·4	MANDIRA PL. (11)	Alt. 108 ft. (33 m.). PL., LS. (1,434). Single-track branch line leaves for Kirklareli. In the next 7 km. there are at least 5 bridges over channels of the Babaeski and other small streams.
251·4	PEHLIVANKÖY (9)	Alt. 82 ft. (25 m.). G.; SLP.; PL., several Sdgs. (1,434 m.). In the next 8 km. there are 4 bridges over small streams.
260·1	PL. (12)	Alt. 66 ft. (20 m.). PL. only (480 m.). Line bends out of Ergene valley through a low cutting into the broad Demirci valley, tributary of the Meriç (Maritsa).
272·1	UZUNKÖPRÜ (10) (*Gaz.*)	Alt. 115 ft. (35 m.). G.; Wb.; SLP.; cattle-ramp; PL., 3 LS. (2,015 m.). The town of Uzunköprü is 4 km. distant, on the other side of the Ergene, and is connected with the station by a bridge and causeway 1·5 km. long.
273	..	Bridge over Demirci stream. Line descends valley with meadow and bush on

Km. from Istanbul	*Stations and passing-loops*	*Remarks*
		both sides. Two culverts and a lattice-girder bridge (6×4·5 m.) are crossed. The country is swampy.
279·3	*Çakmak*	No PL. 2 Sdgs. (402 m.). The Meriç here flows in three main channels, the line crossing them by bridges connected by embankments as follows:
		(*a*) Lattice-girder bridge (2×9 m.) over swamp.
		(*b*) Lattice-girder bridge (3×9 m.+5×24 m.), steel piers, over first channel.
281·0	..	(*c*) Lattice-girder bridge (15×17 m.), piers of steel piping, over middle channel.
281·5	..	(*d*) Box-girder bridge (3×45 m.), masonry piers, over western channel.[1]
		The Greek boundary lies between bridges (*c*) and (*d*).
		Line runs north along Greek side of the boundary to km. 313.
282·3	PYTHION (11)	Formerly Kuleliburgaz. Alt. 79 ft. (24 m.). ES. (dead-end, 1 road); W. (T. 11,000 gls.; Cr., SP.); coal-stack; G.; Wb.; SLP.; PL., MY. (5) (2,503 m.).
		Junction with single-track line south-west to Alexandroupolis (Dedeağaç) and Salonika.
		Line runs parallel with, and about 5 km. west of the Meriç, following undulations 15–17 m. above river-level. 6 bridges are crossed between Pythion and Turiyon.
293·3	TURIYON (7)	Alt. 92 ft. (28 m.). G., cattle-ramp; PL., DES. (1,366 m.).
		6 bridges are crossed between Turiyon and km. 300.
300	NEA ORESTIAS PL. (18)	G.; otherwise PL. only.
		7 bridges are crossed between here and Turkish boundary.
313·7	..	Line re-enters Turkey.
318·3	KARAAĞAÇ (Edirne, *Gaz.*)	Alt. 138 ft. (42 m.). ES. (dead-end, 4 roads); 2 Tbls.; W. (T. 11,000 gls.; Cr., SP.); coal-stacks; small RpS.; G.; Wb.; 3 SLP.; MY. and Sdgs. (7,712 m.).
		Junction for 2·9 km. single-track branch to Edirne town (125 ft., 38 m.; G.; ELP.; LS., 350 m.); rarely used by passengers.
		Main line continues north-west to Sofia and Vienna.

1 *a. Branch Line.* MANDIRA–KIRKLARELI

The branch line crosses diagonally the foothills of a spur running south to north to Babaeski station, and thence north along the

[1] Destroyed by the Greeks in 1941; not repaired by May 1942, but expected to be opened for traffic by July.

crest of a downland spur between the Babaeski and Bokluca (Kurt) streams. Maximum up-gradient northwards 1 in 100; southwards nil. Journey time, passenger trains 2 hours; goods trains 2½ hours.

Distance from Mandira	*Stations and passing-loops*	*Remarks*
0	MANDIRA (10)	Alt. 108 ft. (33 m.). LS. (1,434 m.).
10·3	BABAESKI (10)	Alt. 226 ft. (69 m.). G.; LP.; Wb.; PL., 2 LS. (1,082 m.).
20·2	TAŞAĞIL (15)	Formerly Karaoğlan. Alt: 337 ft. (103 m.). G.; PL. (209 m.).
34·8	KAVAKLI (11)	Alt. 570 ft. (174 m.). G.; PL. (309 m.).
45·6	KIRKLARELI (*Gaz.*)	Alt. 666 ft. (203 m.). ES. (2 roads); Tbl.; W. (T. 5,500 gls.); G.; Wb.; ELP.; SLP.; LS., DES. (1,288 m.).

2. HAYDARPAŞA–ESKIŞEHIR

(*Completed c. 1890; see page 246*)

Route

Haydarpaşa–Izmit	56·7 miles	91·3 kilometres
Izmit–Bilecik	87·4 ,,	140·6 ,,
Bilecik–Eskişehir	50·6 ,,	81·5 ,,
	194·7	313·4

Branch lines

Haydarpaşa–Fenerbahçe (Feneryolu), 3 miles (5·1 km.).
Arifiye–Adapazari, 5·3 miles (8·5 km.).

Permanent way and stations

Gauge, normal (1,435 mm.). Double track, Istanbul–Pendik (24·5 km.). Single track, Pendik–Eskişehir (288·9 km.). Rails, 79 lb. per yd. (39·5 kg./m.); Sleepers, wood (creosoted). Maximum axle-load, 20 metric tons. Minimum radius of curves, 300 m. Maximum gradient: eastwards, 1 in 40, between Bilecik and Karaköy; westwards, 1 in 54, between Derince and Tütünçiftlik. Maximum distance between stations, 19 km. Minimum length of loop lines at stations, 335 m.

Speed and capacity

Overall time (including stops): passenger trains 7 hours; goods trains 17½ hours. Capacity of line: 11 trains each way in 24 hours.

Miscellaneous

Marshalling yards at Haydarpaşa, Pendik, Izmit, Arifiye, Bilecik,

Eskişehir. Locomotive repair shops at Haydarpaşa (small), Eskişehir (large). Engine-sheds at Haydarpaşa, Pendik, Izmit, Adapazari (branch line), Bilecik, and Eskişehir.

GENERAL DESCRIPTION

This line is the first section of the old Anatolian railway to Konya. On leaving Haydarpaşa, it keeps generally close to the coast through a cultivated and thickly populated plain which narrows towards Pendik. Two miles from Haydarpaşa a branch line one mile long leaves for Fenerbahçe pier on a narrow peninsula. The main line diverges from the coast between Maltepe and Kartal, and between the Büyük Dere and Gebze, but is then confined to the coast by the wooded hills to the north, which in places fall steeply from 1,000 feet to sea-level.

For the first 25 miles (40 km.) after Izmit the railway strikes inland, at first along the north side of the marshy plain of the Sapanca depression, and then is carried on embankments along the south shore of the Sapanca lake, a fine stretch of fresh water, 22 miles in circumference. At Arifiye a branch line about 5 miles long leads north to Adapazari, an important trade centre, passing through the open fertile Ak Ova plain.

At Arifiye, about mile 81 (km. 131·5), the main line turns sharply south and enters the Sakarya valley, following the river through the narrow Balaban gorge to Geyve. The country then opens out and the railway diverges from the river, crossing the fertile Akhisar plain, where mulberries, tobacco, melons, cereals, and other fruits and vegetables are grown. At Mekece the valley again contracts, and the line winds with steep gradients along the sides. Before Osmaneli the railway crosses the Sakarya four times, in order to avoid the difficult country where the Gök tributary enters by the Kaleler gorge, but at Osmaneli it enters another defile south-eastwards. About 6 miles farther on, it leaves the Sakarya to ascend the Kara Su defile. Beyond Vezirhan the gorge is very narrow, between precipitous rock-walls 300 feet high, many cuttings, bridges, and a tunnel being necessary.

From Bilecik, which is 965 feet above sea-level, begins the steep rise to the Central Plateau, and within the next 10 miles the railway climbs 1,280 feet, crossing three viaducts and passing through several tunnels as it ascends the Kara Su valley. At Karaköy it is on the edge of the plateau, though still rising at a gentler gradient. Bozüyük, mile 164 (km. 263·3), is to be the junction of a new line to Bursa, which has already been surveyed (1941). Between it and Inönü, mile 174

(km. 280·1) and between Inönü and Eskişehir, the country is of great military interest, with several historic battlefields near this northern gateway to the plateau. Near Eskişehir (Dorylaeum) in the First Crusade (A.D. 1097) Godfrey de Bouillon routed the Seljuks of Konya (Iconium) under Kilij Arslan I, and opened the way into Syria; in the Second Crusade (A.D. 1147) Conrad III was repelled by them. Close to Inönü itself, during the Turkish War of Independence, the Turks under General Ismet won their first two victories against the Greeks (Jan.–Apr. 1921). The railway here rises to its highest point on the run to Eskişehir, 2,805 feet above sea-level, between the valleys of the Kara Su and the Sari Su, and then descends the latter to Eskişehir.

Bosporus Train Ferries

Three train ferries operate between Istanbul (Sirkeci) and Haydarpaşa. Each consists of two large wooden lighters coupled together, decked over, and laid with rails. They are towed by one or two tugs according to the weather, but in stormy weather are suspended. Each ferry can accommodate (i) six 15-ton 2-axle wagons, or (ii) three 40-ton 4-axle wagons or passenger cars, or (iii) one locomotive and two tenders, or (iv) two locomotives and one tender. Loading, ferrying, and unloading in either direction should take not more than 3 hours. Night operation is not undertaken.

DETAILED DESCRIPTION

Km. from Haydarpaşa	*Stations and passing-loops*	*Remarks*
0·0	HAYDARPAŞA (*Port*)	Alt. 13 ft. (4 m.). ES. (round-house, 8 roads); Tbl. (20 m.); W. (T. 22,000 gls.; Cr.); RpS. (heavy); coal-stacks; oil-storage tanks; carriage shed; G.; Cr.; Wb.; SLP.; ELP.; cattle-ramp; MY., numerous Sdgs. (8,500 m.). Covered platforms, buffet. Station is on quay (fig. 6, p. 21). Line runs east along coast of Gulf of Izmit.
1·5	SÖĞÜTLÜÇEŞME	Halt.
1·8	..	Bridge over small stream.
2·6	KIZILTOPRAK	Halt. Alt. 50 ft. (15 m.).
3·3	FENERYOLU	Halt. Branch line to Fenerbahçe pier (*c.* 2 km.).
5·0	GÖZTEPE	Halt. Alt. 150 ft. (46 m.).
6·2	ERENKÖY	Alt. 120 ft. (37 m.). 3 LS. (800 m.).
7·7	SUADIYE	Halt.
9·1	BOSTANCI	Alt. 16 ft. (5 m.). W. (T., Cr., SP.); LS. (360 m.). Small harbour with stone pier. Remains of old walls in the sea.

m. from ydarpaşa	*Stations and passing-loops*	*Remarks*
10·1	KÜÇÜKYALI	Halt.
14·3	MALTEPE	Alt. 26 ft. (8 m.). Short branch after station leads to steamer pier. Steel girder bridge over Drakas stream.
16·5	CIVIZLI	Halt.
20·1	KARTAL (*Port*)	Alt. 33 ft. (10 m.). LS. (235 m.). Landing-stage for steamers from Princes' (Kizil) Islands.
22·6	YUNUS	Halt.
24·5	PENDIK (10) (*Port*)	Alt. 20 ft. (6 m.). ES. (3 roads); Tbl.; W. (T. 9,000 gls.; Cr., SP.); MY. (5), several Sdgs. (1,826 m.). Landing-stage for steamers from Büyükada (Prinkipo), largest of Princes' Is. Double track ends.
28·6	..	Steel girder bridge (2×9 m.) over Büyük stream. The single-track keeps close to the sea for 2 km., then cuts across the base of a small triangular promontory.
34·9	TUZLA (9)	Alt. 66 ft. (20 m.). G.; PL., LS. (524 m.). Village is 2 km. south-west on the coast. Mineral-water springs (medicinal).
35·2	..	Girder bridge (10 m.).
44·2	GEBZE (11)	Alt. 236 ft. (72 m.). G.; PL., LS., DES. (921 m.). Town is 2 km. north-north-east of station and is connected by motor-road, which branches to the coast at Darica and Kale Altiköy.
45·0	..	Eskihisar steel girder viaduct (7 piers) over river (*class.* Libyssus); total length, 246 m. (8×30 m.); middle pier 15 m. high. Line rejoins coast and follows shore to Izmit, often through cuttings.
49·4	..	Tunnel (112 m.).
54·5	..	Tunnel (310 m.).
55·3	DILISKELESI (4)	Alt. 10 ft. (3 m.). G.; cattle-ramp; PL., 2 LS. (1,516 m.).
55·6	..	Lattice-girder bridge, 38 m. long, over Ovadere stream. Beyond Diliskelesi the rocky promontory of Kava Burnu (with stone-quarry) projects towards Dil Burnu on the opposite shore, forming the entrance to the Gulf of Izmit, 3 km. wide.
59·4	TAVŞANCIL (4)	Alt. 20 ft. (6 m.). PL., LS. (506 m.). Village is on hill with hot springs.
63·8	HEREKE (10)	Alt. 10 ft. (3 m.). W. (T. 30,000 gls.; Cr., SP.); G.; PL., DES. (325 m.).
74·0	YARIMCA (6)	Alt. 7 ft. (2 m.). G.; PL., DES. (487 m.).
80·0	TÜTÜNÇIFTLIK (4)	Halt ('Tobacco Farm'). At foot of Çin Dağ (alt. 500 m.). The promontory Zeytin

Km. from Haydarpaşa	*Stations and passing-loops*	*Remarks*
		Burnu forms with Kavak Burnu on the opposite shore the entrance to the inner gulf of Izmit, 2 km. wide.
83·9	DERINCE (7) (*Port*)	Formerly Derinhiye. Alt. 20 ft. (6 m.). ES. (1 road); W. (T. 2,000 gls.; Cr.); G.; Wb.; ELP.; cattle-ramp; PL., 2 LS., 3 DES. (6,700 m.). Rail connexion to the port, which is well equipped.
91·3	IZMIT (Kocaeli) (18) (*Port*)	Alt. 7 ft. (2 m.). ES. (2 roads); Tbl.; W. (T. 11,000 gls.; Cr., SP., well); G.; Wb.; ELP.; SLP.; cattle-ramp; PL., small MY. (3,860 m.). Rail connexion to the port and old naval base.
		Between Izmit and Lake Sapanca there are numerous iron bridges and culverts, spans 2 to 10 m. Span is often too small to drain water in flood-time.
109·6	BÜYÜKDERBENT (14)	Alt. 121 ft. (37 m.). G.; ELP.; SLP.; PL., LS. (695 m.). Station is near west end of Sapanca lake, and serves villages at foot of forest-covered Ağaç Denizli Dağ.
		Line is embanked along south shore of lake.
111·3	..	Girder bridge (20 m.).
114·9	..	Lattice-girder bridge, length 41 m. (2×15 m.). Girders below rail-level.
117·0	..	Girder bridge (10 m.).
117·3	..	Girder bridge (10 m.).
122·4	..	Girder bridge (20 m.).
123·5	SAPANCA (8)	Alt. 118 ft. (36 m.). W. (T. 8,000 gls.; Cr., SP.); G.; Wb.; SLP.; PL., LS. (658 m.). Small hills in vicinity covered with gardens and cultivation.
131·5	ARIFIYE (11)	Alt. 118 ft. (36 m.). W. (T. 13,000 gls.; Cr., SP.); G.; Wb.; SLP.; PL., MY. (4), (1,766 m.).
		Junction with single-track branch line to Adapazari.
[140·0	ADAPAZARI (*Gaz.*)	ES. (3 roads); Tbl. (13·5 m.); W. (T. 3,000 gls.; Cr.); G.; Wb.; SLP.; ELP.; 4 LS. (1,186 m.).]
		From Arifiye the main line turns south up the Sakarya valley.
137·7	..	Lattice-girder bridge, length 40 m. (2×15 m.). Girders below rail-level.
141·9	..	Lattice-girder bridge, over Sakarya, length 166 m. (3×50 m.). Stone piers; girders above rail-level.
		Line follows Sakarya river through Balaban gorge, 13 km. long, enclosed by Gök Dağ and Aksu Dağ.
142·7	..	Masonry bridge, span 12 m.

Km. from Haydarpaşa	*Stations and passing-loops*	*Remarks*
143·2	..	Girder bridge, span 20 m.
143·5	DOĞANÇAY (13)	Alt. 180 ft. (55 m.).
147·8	..	Tunnel (66 m.).
149·3	..	Girder bridge, span 15 m.
153·2	..	Lattice-girder bridge over Sakarya, length 115 m. (2×50 m.); stone piers; girders above rail-level.
155·5	..	Girder bridge, span 20 m.
156·0	GEYVE (12) (*Gaz.*)	Alt. 230 ft. (70 m.). W. (T. 1,750 gls.; Cr., SP.); G.; SLP.; cattle-ramp; PL., LS. (826 m.). Town is 3 km. south of station on right bank of river, and is connected by a road bridge. Valley widens.
167·6	PAMUKOVA (14) (Akhisar)	Alt. 259 ft. (79 m.). G.; SLP.; ELP.; PL., LS. (677 m.).
170·1	..	Girder bridge, span 10 m.
181·3	MEKECE (14)	Alt. 279 ft. (85 m.). W. (T. 8,000 gls.; Cr., SP.); G.; SLP.; PL., LS. (696 m.). Valley contracts, the line winding along its side.
188·8	..	Lattice-girder bridge over Sakarya, length 111 m. (2×50 m.); stone piers; girders above rail-level.
194·7	..	Lattice-girder bridge over Sakarya, length 153 m. (40+60+40 m.); stone piers; girders above rail-level.
195·4	OSMANELI (19)	Alt. 335 ft. (102 m.). G.; PL., LS. (692 m.). Town is about 2 km. west of station.
c. 205	..	Line enters the Osmaneli defile south-eastwards.
210·6	..	Lattice-girder bridge over Kara Su, length 64 m. (2×25 m.); stone piers; girders below rail-level.
214·1	VEZIRHAN (18)	Alt. 486 ft. (148 m.). W. (T. 1,750 gls.; Cr., SP.); G.; SLP.; ELP.; PL., LS. (753 m.).
216·0	..	Line crosses the Bilecik–Gölpazari motor-road, and enters the narrow Karasu gorge, the bare precipitous walls of which are 100 m. high. Many cuttings and 11 girder bridges at km. 217·8 (span 30 m.), 220·2 (30 m.), 220·5 (24 m.), 222·4 (24 m.), 222·6 (30 m.), 222·8 (30 m.), 223·2 (24 m.), 224·3 (24 m.), 224·4 (30 m.), 225·8 (24 m.), and 231·5 (12 m.). There is also a tunnel (66 m.) at km. 222·7. Line crosses the Bilecik–Söğüt and Bilecik–Bozüyük roads before and at Bilecik station.
231·9	BILECIK (8) (*Gaz.*)	Alt. 965 ft. (294 m.). ES. (2 roads); Tbl. (20 m.); W. (T. 50,000 gls.; Cr., SP.); G.; SLP.; PL., MY. (6), DES. (3,098 m.).

Km. from Haydarpaşa	*Stations and passing-loops*	*Remarks*
		Station is on the Bilecik–Bozüyük road, 5 km. south of Bilecik town (alt. 1,550 ft., 473 m.). Road and railway keep close together to Bozüyük.
		Line enters gorge 4·4 km. long.
235·5	..	Pekdemir lattice-girder viaduct over Sorğun tributary of Kara Su; length 192 m. (7 × 25·7 m.); stone piers (average height 17 m.); girders below rail-level.
235·8	..	Girder bridge, span 12 m. Line then curves on embankment.
235·9	..	Tunnel (49 m.).
236·6	..	Tunnel (50 m.).
238·1	..	Başköy viaduct, length 175 m. Central steel arch, span 72 m.; 6 steel piers with stone foundations, 3 on each side of central arch, carrying 4 spans 11–16 m.; height above ravine bottom 38 m.
238·5	..	Tunnel (100 m.).
239·7	YAYLA (9)	PL. only (378 m.). Alt. 1,555 ft. (474 m.).
240·2	..	Yayla lattice-girder viaduct, length 163 m.; 3 steel lattice piers; height above ravine bottom 60 m.
		Between the Yayla viaduct and Karaköy there are 9 tunnels, varying in length from 70 to 410 m., and 3 small bridges (km. 245·1, 245·8, and 246·2).
248·7	KARAKÖY (15)	Alt. 2,057 ft. (627 m.). Tbl. (19·5 m.); W. (T. 8,000 gls.; Cr., SP.); G.; Wb.; SLP.; ELP.; PL., 3 LS. (1,605 m.). Village is to the south in wild surroundings. Line is now on the edge of the Central Plateau above the upper Kara Su, and passes through more open country, closely followed by the Bilecik–Bozüyük road. It crosses 10 small girder bridges (spans 10 or 15 m.) at km. 251·1, 251·4, 252·0, 252·3, 252·4, 253·1, 253·3, 255·1, 255·5, and 256·1. The Inegöl–Eskişehir road joins the Bilecik–Bozüyük road at about km. 254.
263·3	BOZÜYÜK (17) (*Gaz.*)	Alt. 2,428 ft. (740 m.). G.; Wb.; SLPs.; PL., 2 LS., 2 DES. (1,004 m.).
c. 275	..	Line rises to its highest point (2,805 ft., 855 m.) on watershed between Kara Su and Sari Su, and descends valley of latter through open country.
280·1	INÖNÜ (14)	Alt. 2,743 ft. (836 m.). W. (T. 8,000 gls.; Cr., SP.); G.; cattle-ramp; PL., 2 LS. (739 m.). Village is 3 km. to south on slopes of Tutluca Tepe, and is connected by motor-road.

Km. from Haydarpaşa	*Stations and passing-loops*	*Remarks*
294·4	ÇUKURHISAR (19)	Alt. 2,664 ft. (812 m.). G.; PL., LS. (870 m.).
313·4	ESKIŞEHIR (*Gaz.*)	Alt. 2,598 ft. (792 m.). 4 platform tracks. ES. (round-house, 8 roads); Tbl. (20 m.); W. (T. 60,000 gls.; spare T., Cr., SP.); RpS. (large); oil-storage tanks; G.; Cr.; SLP.; PL., MY., numerous Sdgs. (8,812 m.). Junction with Routes 3 (Ankara) and 8 (Konya). Trains to Konya reverse.

3. ESKIŞEHIR–ANKARA

(*Completed 1892; see page 246*)

Route

Eskişehir–Polatli	107·7 miles	173·3 kilometres
Polatli–Ankara	55·9 ,,	89·9 ,,
	163·6	263·2

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, steel. Maximum axle-load, 20 metric tons. Minimum radius of curves, 250 m. Maximum gradient: eastwards, 1 in 83, between Beylikköprü and Polatli; westwards 1 in 100 at several places. Maximum distance between stations, 22 km. Minimum length of loop lines at stations, 390 m.

Speed and capacity

Overall time (including stops): passenger trains 5½ hours; goods trains 10 hours. Capacity of line: 10 trains each way in 24 hours.

Miscellaneous

Marshalling yards at Eskişehir, Polatli, Ankara. Locomotive repair shops at Eskişehir (large), Ankara. Engine-sheds at Eskişehir, Polatli, Ankara.

GENERAL DESCRIPTION

The line was originally a branch of the old Anatolian railway, and follows the natural course of the Porsuk valley eastwards, through country little cultivated. The Boz Dağ, about 4,900 feet high, lies to the north of the valley, the Murat Dağ and Ocak Dağ to the south. The valley, open at first, narrows near Sariköy, and about 2½ miles

beyond Sazilar the line turns south near the junction of the Porsuk and Sakarya rivers, following the latter upstream for about 6 miles to Beylikköprü, beyond which it crosses the river. It now leaves the Sakarya and turns eastwards up a small tributary to Polatli (the site of the Turkish headquarters at the battle of Sakarya in August 1921), and reaches the valley of the Ankara river at Maliköy. The line keeps to the left bank of this river almost to the capital. There are no heavy engineering works on this line.

DETAILED DESCRIPTION

Km. from Eskişehir	*Stations and passing-loops*	*Remarks*
0·0	ESKIŞEHIR (22) (*Gaz.*)	Alt. 2,598 ft. (792 m.). 4 platform tracks. ES. (round-house, 8 roads); Tbl. (20); W. (T. 60,000 gls.; spare T., Cr., SP.); RpS. (large); oil-storage tanks; G.; Cr.; SLP.; PL., MY., numerous Sdgs. (8,812 m.).
		Junction with Routes 2 (Haydarpaşa) and 8 (Konya).
		Line keeps along left bank of the Porsuk for about 10 km.
4·4	*Tayyare*	ELP.; DES. (176 m.); Sdgs. Tayyare ('aircraft') is the station for the Turkish military airfield.
10·0	..	Steel girder bridge over Porsuk; girders above rail-level.
		Line crosses to right bank. Valley bottom is often marshy.
12·5	..	Girder bridge, span 30 m.
19·0	..	Girder bridge, span 10 m.
21·6	AĞAPINAR (18)	Alt. 2,540 ft. (774 m.). SLP.; PL., LS. (789 m.). Village is south of the station.
39·2	ALPIKÖY (22)	Alt. 2,510 ft. (765 m.). W. (T. 13,000 gls.; Cr., well); G.; Wb.; SLP.; ELP.; PL., 2 LS. (872 m.).
39·6	..	PL. (disconnected).
40	..	Steel girder bridge over Porsuk; girders above rail-level.
44	..	Girder bridge, span 10 m.
61·3	BEYLIKAHIR (16)	Alt. 2,480 ft. (756 m.). G.; SLP.; PL., 2 LS. (883 m.).
65	..	Steel girder bridge over Porsuk; girders above rail-level.
		The line passes close to the foothills of the Kartal Dağ.
77·5	YALINLI (15)	Alt. 2,464 ft. (751 m.). PL. (547 m.).
89	..	Girder bridge, span 10 m.
92·4	SARIKÖY (13)	Alt. 2,415 ft. (736 m.). W. (T. 13,000 gls.; Cr., well); G.; Wb.; SLP.; ELP.; PL., 2 LS. (1,042 m.).
105·2	SAZAK (14)	Alt. 2,390 ft. (728 m.). G.; PL., LS. (404 m.).

Km. from Eskişehir	*Stations and passing-loops*	*Remarks*
118·9	BIÇER (19)	Alt. 2,323 ft. (708 m.). W. (T. 13,000 gls.; Cr., well); G.; SLP.; ELP.; PL., LS. (584 m.). Valley widens.
127·8	..	PL. (disconnected).
c. 128	..	Bridge (no details).
139·4	SAZILAR (15)	Alt. 2,254 ft. (687 m.). G.; SLP.; PL., short Sdg. (403 m.). River and railway diverge, river flowing north-east to join the Sakarya. Line bends south-east round foothills, turns south, and follows left bank of the Sakarya upstream.
154·6	BEYLIKKÖPRÜ (19)	Alt. 2,257 ft. (688 m.). W. (T. 13,000 gls.; Cr., well); G.; SLP.; PL., LS., DES. (973 m.).
155·5	..	Line crosses the Sakarya by steel girder bridge, 50 m. long (span 40 m.); girders below rail-level. Line turns eastwards up the Gümüş valley.
161·2	..	PL. (disconnected).
162	..	Girder bridge, span 12 m.
173·3	POLATLI (18)	Alt. 2,874 ft. (876 m.). ES.; Tbl. (13·5 m.); W. (T. 8,000 gls.; Cr., well); G.; Wb.; SLP.; ELP.; PL., small MY. (3) (986 m.).
c. 176	..	Line rises to a col, alt. 3,038 ft. (926 m.), and then descends into the Zilar valley, which it follows north-eastwards until it joins the Ankara valley at Maliköy.
178·6	..	PL. (disconnected).
191·1	YENIDOĞAN (17)	Alt. 2,694 ft. (821 m.). G.; PL., DES. (765 m.). Two bridges (details unknown).
208·3	MALIKÖY (14)	Alt. 2,428 ft. (740 m.). W. (T. 8,000 gls.; Cr., well); G.; Wb.; SLP.; ELP.; PL., LS., DES. (1,169 m.). A road goes direct from here to Ankara. Line follows left bank of Ankara river in narrow valley.
221·6	ESENKENT (15)	Alt. 2,500 ft. (762 m.). G.; PL., DES. (622 m.).
237·0	SINCANKÖY (7)	Alt. 2,585 ft. (788 m.). W. (T., Cr., well); G.; Wb.; ELP.; SLP.; PL., LS. (871 m.). Line follows south bank of river.
244·1[1]	ETIMESUT (ETIMESĞUT) (14)	Alt. 2,640 ft. (805 m.). G.; SLP.; PL., LS. (955 m.). Two bridges (details unknown).
258·7	GAZI (5)	Alt. 2,740 ft. (835 m.). 2 SLP.; PL., LS. (842 m.).
261·7	*Fişekhane*	Halt.
263·2	ANKARA (pp. 28-34)	Alt. 2,782 ft. (848 m.). ES. (4 roads); Tbl.; W. (T. 33,000 gls.; 2 Cr.); G.; Cr.; Wb.; LP.; MY. and numerous Sdgs. (4,143 m.). Head offices of State Railways adjoin station.

[1] There is some doubt about this distance. According to one account it is 242·1.

4. ANKARA–IRMAK–KAYSERI

(Completed 1927; see page 253)

Route

Ankara–Irmak	43·5 miles	70·0 kilometres
Irmak–Kayseri	192·6 „	310·0 „
	236·1	380·0

Junctions

The line to Filyos and Zonguldak on the Black Sea (Route 11) leaves at Irmak, mile 43·5 (km. 70); that to Kardeşgediği, Ulukişla, and Adana (Route 10) at Boğazköprü, mile 227 (km. 365).

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, steel. Maximum axle-load, 20 metric tons. Minimum radius of curves, 240 m. near Küçük Yozgat and Yerköy. Maximum gradient: eastwards, 1 in 66; westwards, 1 in 50 near Küçük Yozgat. Maximum distance between stations, 27 km. between Yerköy and Caferli.

Speed and capacity

Overall time (including stops): passenger trains 8 hours; goods trains 16 hours. Capacity of line: 11 trains each way in 24 hours.

Miscellaneous

Marshalling yards at Ankara, Irmak, Yerköy, Boğazköprü, Kayseri. Locomotive repair shops at Ankara and Kayseri. Engine-sheds at Ankara, Irmak, Yerköy, and Kayseri.

GENERAL DESCRIPTION

There are few engineering difficulties on this route, and for much of the distance the line crosses open plateau or follows the open valleys of the plateau. Scarcity of water, however, presents problems in some parts. There are some sharp bends and a steep descent from the plateau downwards past Küçük Yozgat (mile 27·1) to the Kizil Irmak, and it is in this section that tunnelling is mainly concentrated. After crossing this river, the line follows its valley southwards and climbs out of it more gradually by the Çoruhözü. There are some sharp turns near Izzettin, near the watershed of the Delice Irmak, but this latter river provides an easy natural route for much of the way. Towards the end, both the Kizil Irmak and the Sarmisakli have

to be crossed by large bridges, but bridging presents few problems along the remainder of the route. The journey across the barren plateau is monotonous, and the green surroundings of Kayseri come as a welcome contrast. Details of the bridges are not available.

DETAILED DESCRIPTION

Km. from Ankara	*Stations and passing-loops*	*Remarks*
0·0	ANKARA (7) (pp. 28-34)	Alt. 2,782 ft. (848 m.). ES. (4 roads); Tbl.; W. (T. 33,000 gls.; 2 Cr.); G.; Cr.; Wb.; LP.; MY. and numerous Sdgs. (4,143 m.). Head offices of State Railways adjoin station.
1·3	*Yenişehir*	Halt.
1·9	*Kurtulus*	Halt.
3·1	*Cebeci*	Halt.
3·7	*Demirlibahçe*	Halt.
5·3	*Saymakadin*	Halt.
6·6	MAMAK (5)	Alt. 2,903 ft. (885 m.). G.; PL.
7·3	..	Tunnel.
9·0	*Uregil*	Halt.
12·0	KAYAŞ (15)	Alt. 3,068 ft. (935 m.). G.; SLP.; PL., LS. (745 m.).
		Line enters the defile of the Hatip stream.
27·0	LALAHAN (17)	Alt. 3,520 ft. (1,073 m.). W. (T. 18,000 gls.; Cr.); G.; SLP.; PL., LS. (723 m.).
		Line crosses almost deserted and uninhabited plateau, grazed by occasional herds of 'Angora' goats.
		Bridge over Lala stream (no details).
35·6	LALABEL	PL. only.
c. 42	..	Bridge over stream (no details).
		Line crosses watershed of Kizil Irmak and begins to descend.
43·7	KÜÇÜK YOZGAT (ELMADAĞ) (8)	Village known alternatively as Elmadağ and Asiyozgat; sometimes referred to as Kyozgat. Alt. 3,580 ft. (1,091 m.). W. (T. 11,000 gls.; Cr.); G.; Wb.; PL., LS., 2 DES. (1,098 m.). Armaments factory.
		Line begins to wind down the slopes of the Elmadağ (Tekke) valley, passing through 6 tunnels totalling 815 m. between km. 45 and 49.
51·9	KURBAĞLI (9)	PL. only.
		Line continues descent along hillside, passing through 6 tunnels totalling 650 m. between km. 53 and 57.
c. 60	..	Bridge over stream (details unknown).
60·4	KILINÇLAR (10)	Alt. 2,562 ft. (781 m.). W. (T. 18,000 gls.; Cr.); PL., LS. (719 m.).
c. 62	..	Bridge over Elmadağ stream (details unknown).
		Line follows left bank of Ökuh tributary of Kizil Irmak.
70·0	IRMAK (16)	Alt. 2,227 ft. (679 m.). ES. (2 roads); Tbl.; W.

Km. from Ankara	*Stations and passing-loops*	*Remarks*
		(T. 44,000 gls.; Cr.); coal-stacks; Cr.; PL., small MY. (5) (2,375 m.). Junction for Route 11, single-track line to Black Sea coast at Filyos and Zonguldak.
72	..	Steel lattice-girder bridge, *c.* 100 m. long (3 × 30 m.), over Kizil Irmak; girders above rail-level. Line turns south up right bank of Kizil Irmak, passing through 2 tunnels (220 m. long at km. 73; 165 m. long at km. 82).
86	YAHŞIHAN (7)	Alt. 2,231 ft. (680 m.). G.; Wb.; ELP.; PL., LS., short DES. (956 m.). Line turns east out of Kizil Irmak valley and begins to ascend Çoruhözü tributary.
92·5	KIRIKKALE (22)	Alt. 2,310 ft. (704 m.). G.; PL., MY. (4) (1,246 m.). State munitions factory, with private Sdgs.
102	*Mahmutlar*	Alt. 2,503 ft. (763 m.). G.; PL. and Sdgs. (disconnected).
112	..	Line follows Çoruhözü valley, passing through tunnel (100 m.).
114	BALIŞEYH (BALIŞOH) (12)	Alt. 2,815 ft. (858 m.). W. (T. 13,000 gls.; Cr.); G.; PL., LS. (752 m.).
125·5	..	Tunnel (225 m.).
126·2	IZZETTIN (21)	Alt. 3,110 ft. (948 m.). G.; PL., 2 LS. (772 m.). Line begins descent towards the Delice Irmak.
135·5	..	PL. (disconnected).
146·8	ÇERIKLI (14)	Alt. 2,230 ft. (680 m.). W. (T. 13,000 gls.; Cr.); G.; PL., LS. (792 m.).
153·8	..	Line crosses Delice Irmak (details of bridge unknown) and then ascends right bank.
161·2	YENIYAPAN (18)	Alt. 2,192 ft. (668 m.). G.; PL.; LS. (752 m.).
c. 170	..	Bridge over side-stream (details unknown).
179·4	SEKILI (24)	Alt. 2,310 ft. (704 m.). W. (T. 13,000 gls.; Cr.); G.; PL., 2 LS. Bridge over stream at station. Delice Irmak valley opens out.
c. 187	..	Bridge over Inandik stream (details unknown).
c. 191	..	Line crosses Delice Irmak (details of two-span bridge unknown) and ascends left bank.
193·6	..	PL. (disconnected).
203·5	YERKÖY (27)	Alt. 2,507 ft. (764 m.). ES. (2 roads); Tbl.; W. (T. 22,000 gls.; Cr.); G.; Wb.; ELP.; SLP.; PL., small MY. (3) (1,588 m.).
c. 204	..	Line crosses Delice Irmak by bridge (details unknown). Yozgat–Kirşehir motor-road crosses at the same point.
c. 206	..	Bridge over side-stream (details unknown).
c. 214	..	Line recrosses Delice Irmak (details of bridge unknown), and passes through 4 tunnels before reaching Caferli. One at about km. 217 is 565 km. long. There is a disconnected PL. at km. 217·8.
230·0	CAFERLI (9)	Alt. 2,870 ft. (875 m.). G.; PL. (378 m.).

Km. from Ankara	*Stations and passing-loops*	*Remarks*
239·1	ŞEFAATLI (18)	Alt. 2,972 ft. (906 m.). W. (T. 18,000 gls.; Cr.); G.; SLP.; PL., LS. (737 m.). Village is sometimes called Haci Şefaatli.
256·9	ÇILBAH (17)	Alt. 3,087 ft. (941 m.). G.; PL., LS. (730 m.).
273·4	KANLICA (17)	Alt. 3,192 ft. (973 m.). G.; PL., LS. (708 m.). Line crosses two streams and turns south.
290·0	FAKILI (20)	Alt. 3,307 ft. (1,008 m.). W. (T.; Cr.); G.; ELP.; SLP.; PL., 2 LS. (746 m.). Line passes over open plateau.
298·3	..	Watering post. Alt. 3,406 ft. (1,038 m.). W. (T. 9,000 gls.; Cr.).
303·4	..	PL. (disconnected).
309·8	PAŞALI (20)	Alt. 3,652 ft. (1,113 m.). G.; PL., LS. (768 m.). Line reaches watershed between the Delice Irmak and the Kizil Irmak.
329·7	HIMMETDEDE (21)	Alt. 4,009 ft. (1,222 m.). G.; PL., LS. (750 m.). The main road from Ankara and Kirşehir to Kayseri joins the line here.
c. 349	..	Line crosses the Kizil Irmak by a large lattice-girder bridge (details unknown).
350·2	BEYDEĞIRMENI (15)	Alt. 3,232 ft. (985 m.). Station on south bank of Kizil Irmak. W. (T. 22,000 gls.; Cr.); G.; PL., LS. (747 m.).
357·8	..	Line crosses Sarmisakli river by bridge (details unknown).
362·0	..	Loop to Route 10, single-track line to Kardeşgediği and Adana.
365·0	BOĞAZKÖPRÜ (15)	Alt. 3,400 ft. (1,037 m.). G.; SLP.; ELP.; PL.; MY. (3) (2,222 m.). Junction for single-track line to Kardeşgediği, Ulukişla, and Adana (Route 10).
c. 370	..	Bridge over Sarmisakli river (no details).
380·0	KAYSERI (*Gaz.*)	Alt. 3,440 ft. (1,049 m.). ES. (2 roads); Tbl.; W. (T. 55,000 gls.; 3 Cr.); G.; Wb.; SLP.; ELP.; MY. and numerous Sdgs. (3,751 m.).

5. KAYSERI–ŞARKIŞLA–SIVAS

(*Completed 1930; see page 253*)

Route

Kayseri–Şarkişla	80·8 miles	130·1 kilometres
Şarkişla–Sivas	57·4 „	92·3 „
	138·2	222·4

Junctions

The line to Samsun on the Black Sea (Route 12) leaves at Kalin, mile 123 (km. 198).

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, steel. Maximum axle-load, 20 metric tons. Minimum radius of curves, 300 m. Maximum gradient, 1 in 66 in both directions. Maximum distance between stations, 20 km.

Speed and capacity

Overall time (including stops): passenger trains 5½ hours; goods trains 8 hours. Capacity of line: 14 trains each way in 24 hours.

Miscellaneous

Marshalling yards, locomotive repair shops, and engine-sheds at Kayseri and Sivas. The main workshops of the railway system are at Sivas.

GENERAL DESCRIPTION

The line ascends the broad valley of the Sarmisakli, keeping well to its south-east side and then entering the separate basin of the Tuzla Göl. Near Sarioğlan it finds its way by a tributary to the Kizil Irmak, which it follows for over 12 miles, before turning south-east into another side valley. From Gemerek, mile 58 (km. 93·9), it diverges from the Kizil Irmak and is separated from that river by the Incebel and Şama heights, but the country opens out by Şarkişla. At Hanli the railway takes a narrow valley by Bedirli back to the Kizil Irmak, thereby leaving the road which goes straight on to Sivas. The line then keeps to the Kizil Irmak valley, being joined at Kalin by the important railway from Samsun on the Black Sea coast. There are no large engineering works, but a number of bridges, the details of which are not available. No attempt has been made to interpret them from existing maps which are inaccurate in detail.

The greater part of the country passed through is exposed and barren, but there are some resources. There are rich beds of rock salt near Muncusun, and at the Tuzla Göl salt-works at Palas between Tuzhisar and Sarioğlan. Şarkişla is a fairly large market-town with trees that give it the aspect almost of an oasis. Not far from Bedirli, there are other large salt-works at Bingöl.

DETAILED DESCRIPTION

Km. from Kayseri	*Stations and passing-loops*	*Remarks*
0·0	KAYSERI (19) (*Gaz.*)	Alt. 3,440 ft. (1,049 m.). ES. (2 roads); Tbl.; W. (T., 55,000 gls.; 3 Cr.); G.; Wb.; SLP.; ELP.; MY. and numerous Sdgs. (3,751 m.). Line turns north-east, traversing a little-culti-

Km. from Kayseri	*Stations and passing-loops*	*Remarks*
		vated plain, and crosses some tributary streams of the Sarmisakli.
19·2	GÖMEÇ (10)	Alt. 3,583 ft. (1,092 m.). G.; PL.; LS. (566 m.). Village is about 5 km. north of station.
		Line follows Sarmisakli valley, open and exposed to wind.
c. 27	..	Line crosses Sarmisakli river.
29·2	SARMISAKLI (15)	Alt. 3,850 ft. (1,173 m.). G.; PL.; LS. (disconnected).
		Line crosses into open basin of Tuzla Göl.
43·8	TUZHISAR (20)	Alt. 4,110 ft. (1,253 m.). W. (T. 18,000 gls.; Cr.); G.; PL., LS. (962 m.).
		Near Palas, *c.* km. 55, the line passes the Tuzla Göl salt-works.
63·4	SARIOĞLAN (14)	Alt. 3,760 ft. (1,146 m.). G.; PL., LS. (953 m.).
c. 75	..	Line reaches the Kizil Irmak and follows left bank up-river.
c. 77	..	Tunnel.
77·4	KARAÖZÜ (16)	Alt. 3,710 ft. (1,131 m.). G.; PL. (517 m.).
c. 90	..	Line leaves Kizil Irmak and follows side-stream, dominated on south by outliers of the Hinzir Dağ.
93·9	GEMEREK (17)	Alt. 3,790 ft. (1,155 m.). W. (T. 18,000 gls.; Cr.); G.; PL., LS. (953 m.).
c. 97	..	Bridge.
111·0	IHSANLI (19)	Alt. 4,232 ft. (1,290 m.). PL. (513 m.).
c. 122	..	Bridge over Aciboğaz stream.
130·1	ŞARKIŞLA (16)	Alt. 4,032 ft. (1,229 m.). G.; PL., LS. (838 m.).
		Line follows Şarkişla depression, roughly parallel to that of the Kizil Irmak.
146·5	PL. (6)	Alt. 4,367 ft. (1,331 m.). G.; PL. (504 m.).
152·3	HANLI (18)	Alt. 4,367 ft. (1,331 m.). G.; PL., LS., DES. (1,339 m.).
		Line turns north, and follows a narrow valley back towards the Kizil Irmak.
c. 167	..	Tunnel.
169·8	BEDIRLI (15)	Alt. 4,104 ft. (1,251 m.). G.; PL., LS. (928 m.).
c. 178	..	Line reaches bank of Kizil Irmak, and follows left bank, but cuts across the base of river-loops.
c. 185	..	Tunnel.
185·4	PL. (13)	Alt. 4,058 ft. (1,237 m.). G.; PL. (490 m.).
198·0	KALIN (15)	Alt. 4,127 ft. (1,258 m.). W. (T. 18,000 gls.; Cr.); G.; PL., 2 LS. (1,251 m.). Junction for single-track line (Route 12) to Samsun.
		Bridge over Kizil Irmak.
213·2	SÖĞÜTLÜHAN (9)	Sometimes called Söğütlühamam. Alt. 4,124 ft. (1,257 m.). PL. (517 m.).
222·4	SIVAS (*Gaz.*)	Alt. 4,150 ft. (1,265 m.). ES.; Tbl.; W (T. 30,000 gls.; 2 Cr.); main RpS.; G.; PL. and numerous Sdgs. (2,419 m.).

6. SIVAS–ÇETINKAYA

(Completed 1936; see page 253)

Distance: 69·6 miles, 112·0 kilometres.

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, steel. Maximum axle-load, 20 metric tons. Minimum radius of curves, 250 m. between Tecer and Eskiköy. Maximum gradient: eastwards, 1 in 66; westwards, 1 in 55. Maximum distance between stations, 21 km. between Tecer and Eskiköy.

Speed and capacity

Overall time (including stops): passenger trains 3½ hours; goods trains 5 hours. Capacity of line: 10 trains each way in 24 hours.

Miscellaneous

Marshalling yards and engine-sheds at Sivas and Çetinkaya. Locomotive repair shops at Sivas.

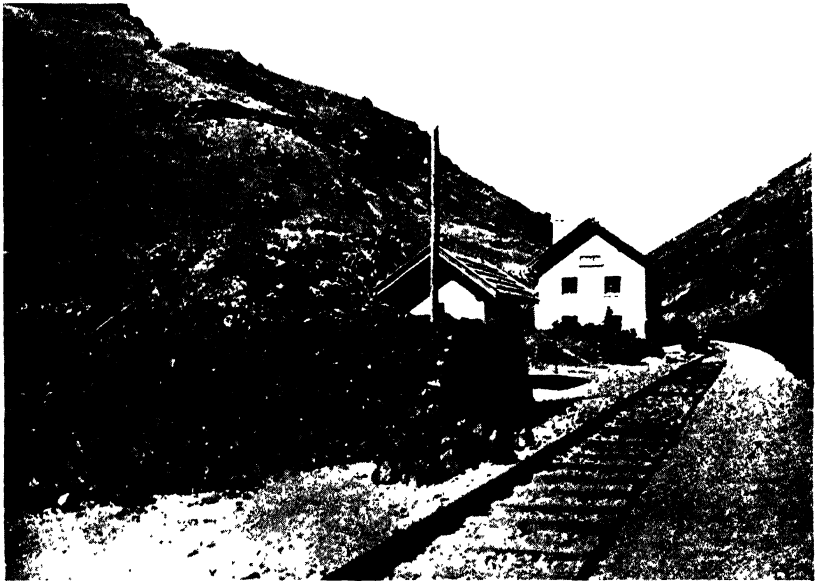
GENERAL DESCRIPTION

The railway turns south at Sivas, crosses the Kizil Irmak, and passes up the enclosed valley of the Tecer tributary, keeping parallel to and about 3 miles west of the Ulaş road. After Taşlidere the country opens out and the line traverses more open country to Ulaş, where it turns up the Ulaş valley and at Karagöl crosses the watershed between the Kizil Irmak and the Euphrates. From here it follows the uppermost valley of the Çalti river to Çetinkaya, the important junction for the lines to Erzurum (Route 7) and Malatya (Route 23).

There are a number of bridges on this route, but details are not available. A list of stations and station facilities is given below; but it is believed that the line was damaged during the 1939 earthquakes. It is uncertain whether there is a passing-loop at Taşlidere and Bozarmut stations.

DETAILED DESCRIPTION

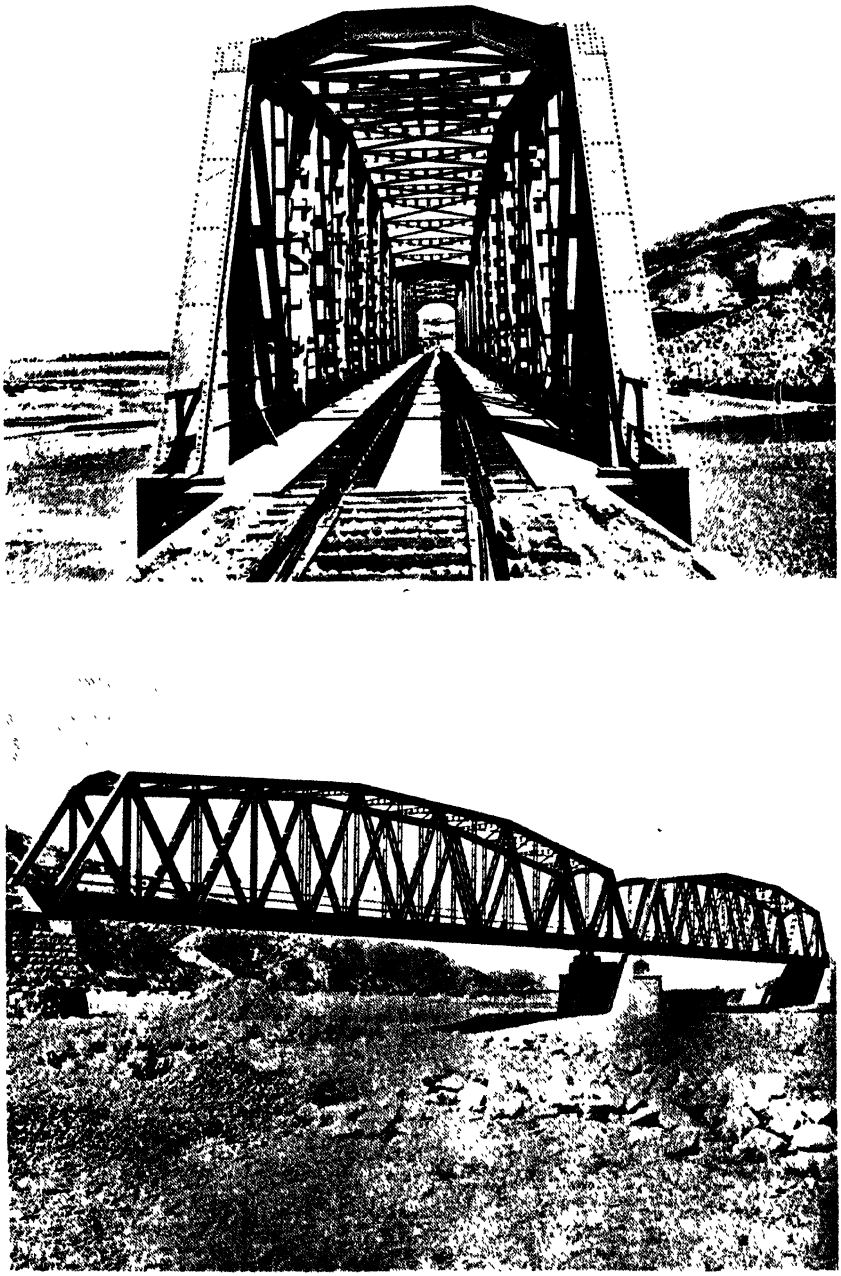
Km. from Sivas	*Stations and passing-loops*	*Remarks*
0·0	SIVAS (14) (*Gaz.*)	Alt. 4,150 ft. (1,265 m.). ES.; Tbl.; W. (T. 30,000 gls.; 2 Cr.); Main RpS.; G.; PL. and numerous Sdgs. (2,419 m.).
13·5	TAŞLIDERE (15)	Alt. 4,320 ft. (1,317 m.). Station details not known.
28·0	BOSTANKAYA (15)	Alt. 4,445 ft. (1,355 m.). G.; PL., LS. (1,345 m.).



70. *Çetinkaya–Erzurum railway. Iron-ore at Cürek station, km. 51·4*



71. *Çetinkaya–Erzurum railway. Masonry railway bridge and old road bridge between Guneş and Cürek*



72, 73. *Çetinkaya–Erzurum railway. Euphrates bridge at c. km. 96 near Çalti station; two spans of 60 metres*

Km. from Sivas	*Stations and passing-loops*	*Remarks*
42·9	TECER (21)	Alt. 4,593 ft. (1,400 m.). W. (T.; Cr.); G.; Wb.; PL., LS. (1,346 m.).
63·5	ESKIKÖY (13)	Alt. 5,121 ft. (1,561 m.). W. (reserve T.); PL., LS. (1,374 m.).
76·0	KARAGÖL (21)	Alt. 5,630 ft. (1,716 m.). PL., LS. (1,346 m.).
89·4	*Bozarmut*	Alt. 5,026 ft. (1,532 m.). No details of station. Probably no PL.
96·5	ARMAĞAN (16)	Alt. 4,836 ft. (1,474 m.). W. (Cr.); G.; Wb.; PL., LS. (1,374 m.).
112·0	ÇETINKAYA	Alt. 4,639 ft. (1,414 m.). ES. (2 roads); Tbl.; W. (T.; Cr.); G.; Wb.; PL., MY. (4), several Sdgs. (3,400 m.). Junction with Routes 7 (Erzurum) and 23 (Malatya).

7. ÇETINKAYA–ERZINCAN–ERZURUM

(*Completed 1939; see page 253*)

Route

Çetinkaya–Erzincan	138·9 miles	223·6 kilometres
Erzincan–Erzurum	131·7 ,,	212·0 ,,
	270·6	435·6

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, steel. Maximum axle-load, 20 metric tons. Minimum radius of curves, 250 m. Maximum gradient: eastwards, 1 in 66; westwards, 1 in 55. Maximum distance between stations: 22 km. between Sansa and Tercan.

Speed and capacity

Overall time (including stops): to Erzurum (not known); to Erzincan, mixed trains 11 hours; goods trains 13 hours. Capacity of line: Çetinkaya to Erzincan: 8 trains each way in 24 hours. Erzincan–Erzurum, not known.

Miscellaneous

Marshalling yards and engine-sheds at Çetinkaya, Erzincan, and Erzurum. Locomotive repair shops at Erzurum.

GENERAL DESCRIPTION

No detailed description of this line is yet available, and its route is not accurately shown on maps. The country traversed is very difficult,

and there are many engineering works. The details given below are from several sources, some compiled during the construction of the line, others from doubtful material. The line is known to have been damaged during the earthquakes of 1939, but how much is uncertain. For these reasons the details must be accepted with reserve.

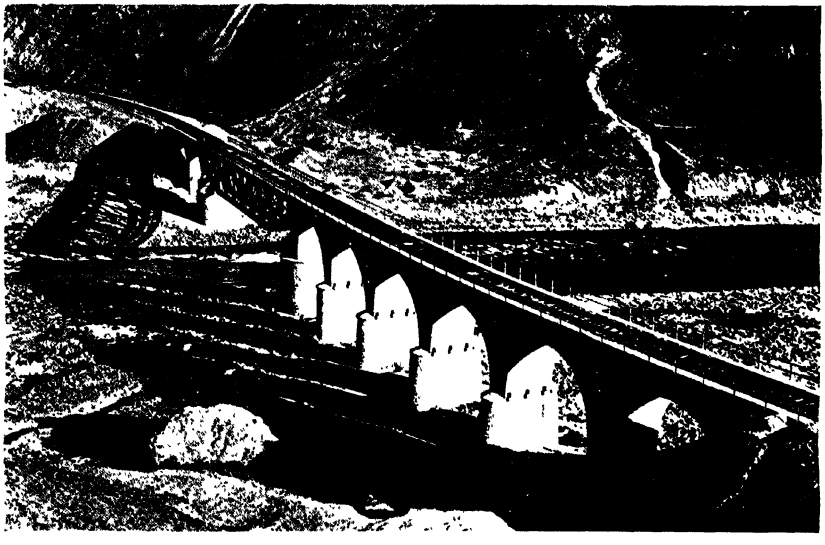
On leaving Çetinkaya the line descends the Kangal (upper Çalti) valley, where it is known as the 'Iron Railway', because it serves the iron-ores of Cürek and Divrik, most of the ore being transported from these two stations. After Divrik the line passes through the Çalti gorge, where there are 14 bridges in just over 2 miles, besides 24 tunnels totalling about 920 yards (840 m.). Near the junction of the Çalti with the Euphrates (Kara Su) the line crosses the broad open river-bed of the latter by a lattice-girder bridge of two spans, each of 60 metres, and then ascends its valley eastwards. For the next 60 miles the Kara Su is deeply embedded between high mountains which close in and form gorges in some places. Both the Pingan and Atma gorges are formidable obstacles with almost continuous bridges, tunnels, and other engineering works. The line emerges from a tunnel into more open country at Kemah, but between here and Erzincan the valley again closes in and there are again many works. The open plain of Erzincan, though marshy, presents few difficulties, but beyond Tunceli the valley is again enclosed. Before reaching Tercan the line changes direction sharply where the Tercan joins the Karasu. Between Karasu station and Erzurum there are said to be 224 bridges with spans of less than 5 metres, and 61 larger ones (some with spans of 40 metres or more); there are also 2 tunnels, but the locations of these works are not available at the time of writing.

DETAILED DESCRIPTION

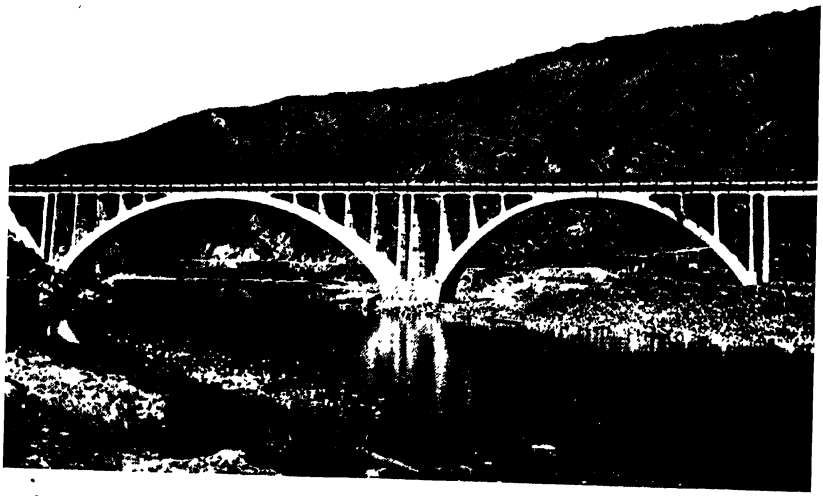
Km. from Çetinkaya	*Stations and passing-loops*	*Remarks*
0·0	ÇETINKAYA (16)	Alt. 4,639 ft. (1,414 m.). ES. (2 roads); Tbl.; W. (T., Cr.); G.; Wb.; PL., MY. (4), several Sdgs. (3,400 m.). Junction with Routes 6 (Sivas) and 23 (Malatya). Line descends Kangal valley eastwards.
15·5	AVŞAR (15)	Alt. 4,347 ft. (1,325 m.). G.; PL., LS. (1,330 m.).
c. 21	..	Steel girder bridge (5 × 10 m.) over Kürtler stream.
c. 24	..	Steel girder bridge, 50 m. long, probably similar to the above.



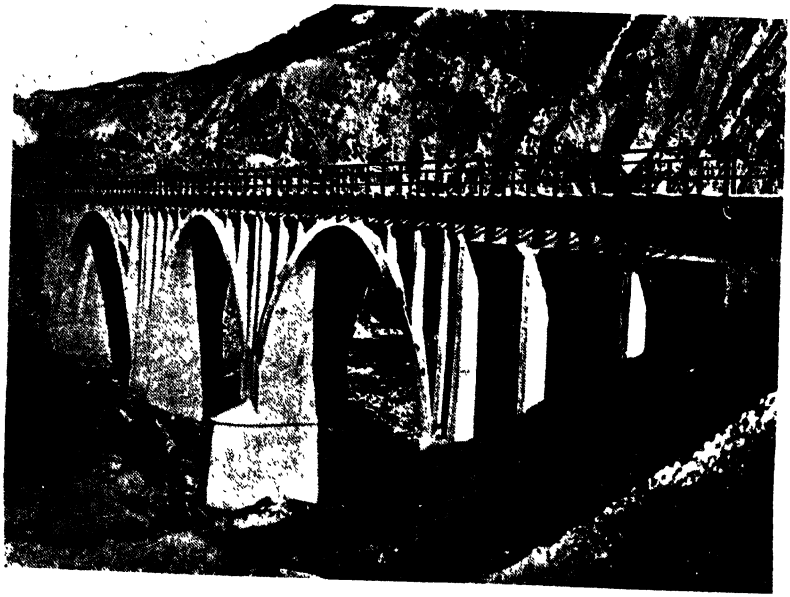
74. *Çetinkaya-Erzurum railway. The Atma gorge between kms. 130 and 145*



75. *Çetinkaya–Erzurum railway. Masonry viaduct and girder bridge over the Euphrates, at km. 158*



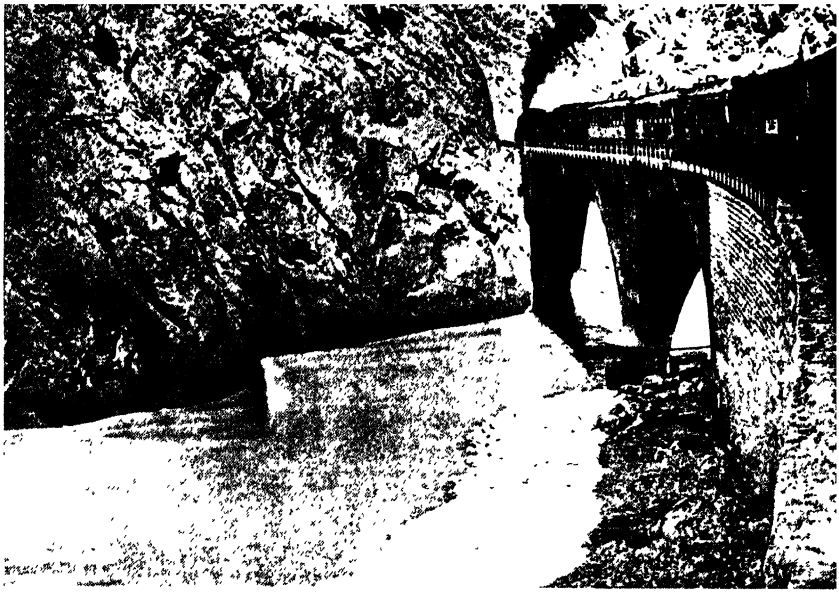
76. *Çetinkaya–Erzurum railway. A reinforced concrete bridge across the upper Euphrates (Kara Su)*



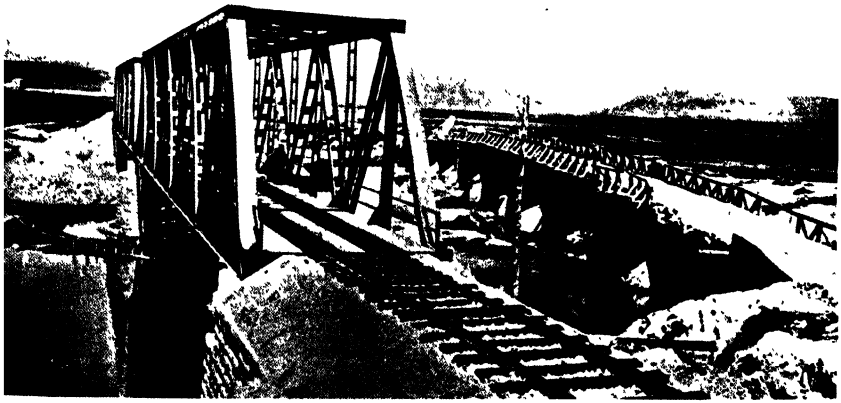
77. *Çetinkaya–Erzurum railway. Reinforced concrete bridge at km. 277·7*

Km. from Çetinkaya	*Stations and passing-loops*	*Remarks*
30·1	GÜNEŞ (21)	Alt. 3,980 ft. (1,213 m.). G.; PL., LS. (1,330 m.). River is here known as the Çalti Suyu; line continues to follow its valley.
38	..	Ferro-concrete bridge (5 × 8 m.) over Çalti river.
40	..	Bridge (9 × 8 m.).
45	..	Bridge (8 × 8 m.) (photo. 71).
51·4	CÜREK (14)	Alt. 3,448 ft. (1,051 m.); G.; PL., LS. (1,330 m.).
64·9	DIVRIK (DIVRIĞI) (15) (*Gaz.*)	Alt. 3,202 ft. (976 m.); W. (T., Cr.); G.; Wb.; PL., LS. (1,330 m.). Between Divrik and Çalti the river passes through the Çalti gorge, where there are numerous tunnels and much bridging.
80·3	DAZLAK (12)	Alt. 2,946 ft. (898 m.); PL., LS. (917 m.).
92·6	ÇALTI (17)	Alt. 2,822 ft. (860 m.); G.; PL., LS. (1,330 m.). Junction of Çalti Suyu and the Euphrates (Kara Su).
c. 96	..	Line crosses the Euphrates by lattice-girder bridge (2 × 60 m.); stone piers (photos. 72, 73).
100–8	..	Line ascends left bank of Euphrates through Piran gorge, passing through several tunnels, totalling 680 m. From here onwards there are many bridges over tributaries of the Kara Su.
110·0	BAGIŞTAŞ (10)	Alt. 2,868 ft. (874 m.). W. (Cr.); G., PL., LS. (1,330 m.).
120·3	ILIÇ (20)	Alt. 2,920 ft. (890 m.). W. (Cr.); G., PL., LS. (1,330 m.). A road bridge spans the Kara Su at Iliç.
121–36	..	In this section the Kara Su is deeply cut between precipitous rock-walls. There are 60 bridges, of which 11 have spans greater than 5 m., and 16 tunnels with a total length of 3,316 m. Most of these works are in the Atma gorge, which is entered at about km. 130, and which is the most difficult part of the whole line (photo. 74).
140·3	GÜLLÜBAĞ (17)	Alt. 3,060 ft. (933 m.). W. (Cr.); G.; PL., LS. (1,330 m.).
136–57	..	In this section also there are numerous bridges. Fourteen tunnels, totalling 3,499 m., include the Güllübağ tunnel (912 m.) at km. 141.
157·7	ERIÇ (18)	Alt. 3,182 ft. (971 m.). G.; PL., LS. (1,330 m.).
158	..	Viaduct over the Kara Su (6 × 10 m. + 50 m. + 2 × 10 m.) (photo. 75). Between Eriç and Erzincan there are 16 tunnels, totalling 5,700 m., including 1 of 1,344 m. and 1 of 662 m. There are at least 6 reinforced concrete bridges of considerable size between Eriç and Kemah.
175·2	KEMAH (17) (*Gaz.*)	Alt. 3,412 ft. (1,040 m.). W. (T., Cr.); G.; PL., LS. (1,330 m.).

Km. from Çetinkaya	*Stations and passing-loops*	*Remarks*
		At Kemah the Kara Su is crossed by a suspension road-bridge. The valley is now more open. There are at least 6 bridges between Kemah and Alp.
192·5	ALP (15)	Alt. 3,580 ft. (1,091 m.). G.; PL., LS. (1,330 m.). Two bridges, at km. 194·1, and 205·8, are known between Alp and Sürek.
207·0	SÜREK (4)	Alt. 3,734 ft. (1,138 m.). PL., LS. (917 m.).
c. 210	..	Large bridge (2×8 m.+60 m.+2×8 m.).
210·8	DÜMANLI (3)	Alt. 3,773 ft. (1,150 m.). G.; PL., LS. (1,330 m.).
214·0	FIDANLIK (10)	Alt. 3,812 ft. (1,162 m.). G.; PL., LS. (917 m.).
216·4	..	Reinforced concrete bridge (10×8 m.).
223·6	ERZINCAN (18) (*Gaz.*)	Alt. 3,894 ft. (1,187 m.). ES.; Tbl.; W. (T., Cr.); PL., MY (20 roads). Line traverses marshy plain of Erzincan, crossing numerous small bridges.
241·4	ALTINBAŞAK (15)	Alt. 3,816 ft. (1,163 m.). G.; PL., LS. (1,330 m.).
256·5	TUNCELI (15)	Formerly Sarikaya. Alt. 3,917 ft. (1,194 m.). G.; PL., LS. (1,330 m.).
262·1	..	Reinforced concrete bridge (7·5 m.+50 m.+35 m. +6 m.).
271·9	GEÇIT (17)	Alt. 4,147 ft. (1,264 m.). G.; PL., LS. (1,330 m.).
274·7	..	Reinforced concrete bridge over Kara Su (main span 68 m., 3 subsidiary spans).
277·7	..	Reinforced concrete bridge (main spans, 2×20 m. +35 m., several small spans) (photo. 77).
288·8	SANSA (22)	Alt. 4,492 ft. (1,369 m.). G.; PL., LS. (1,330 m.).
301·0	*Kargin*	Alt. 4,528 ft. (1,380 m.). Halt only.
309·2	..	Line crosses Kara Su near junction with Tercan river by Kötür box-girder bridge (2×50 m.+2× 12 m.) (photo. 79).
310·5	TERCAN (13)	Alt. 4,541 ft. (1,384 m.). G.; 3 LS. (2,060 m.).
323·5	PEKERIÇ (12)	Alt. 4,757 ft. (1,450 m.). G.; PL., LS. (1,330 m.).
329·7	..	Reinforced concrete bridge over Tuzla river, length 110 m. (7+9+7 m.+45 m.+7+9+7 m.).
335·3	ERBAŞ (14)	Alt. 4,797 ft. (1,462 m.). G.; PL., LS. (1,330 m.).
345·6	..	Lattice-girder bridge over Kara Su, length 135 m. (2×60 m.).
349·2	KARASU (18)	Alt. 5,066 ft. (1,544 m.). G.; PL., LS. (1,330 m.). For engineering works from Karasu onwards, *see* summary in the description of route (p. 286).
367·3	SAPTIRAN (13)	Alt. 5,250 ft. (1,600 m.). G.; PL., LS. (1,330 m.).
380·3	AŞKALE (15)	Alt. 5,480 ft. (1,670 m.). Tbl.; G.; PL., several Sdgs.
395·7	KANDILLI (15)	Alt. 5,609 ft. (1,709 m.). G.; PL., 3 LS., short DES. (2,060 m.).
410·7	ÇIÇEKLI (11)	Alt. 5,719 ft. (1,743 m.). G.; PL., 3 LS. (2,060 m.).
421·6	KAPLICA (14)	Alt. 5,768 ft. (1,758 m.). G., 3 LS., short DES. (2,060 m.).
435·6	ERZURUM (*Gaz.*)	Alt. 6,096 ft. (1,858 m.). ES.; W.; RpS.; G.; MY., Sdgs.



78. *Çetinkaya–Erzurum railway. A passenger train passing through one of the gorges of the upper Euphrates*



79. *Kötür road and railway bridges near the junction of the Kara Su and Tercan Su, km. 309·2, Çetinkaya–Erzurum railway*



80. *Engine repair shops at Eskişehir*

8. ESKIŞEHIR–AFYONKARAHISAR–KONYA

(Completed 1896; see page 246)

Route

Eskişehir–Afyonkarahisar	100·2 miles	161·2 kilometres
Afyonkarahisar–Konya	169·3 „	272·5 „
	269·5	433·7

Junctions

The line to Kütahya and Balikesir (Route 16) leaves at Alayunt, mile 41·6 (km. 66·9); Afyonkarahisar is the junction for lines to Izmir (Routes 14, 17).

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, wooden. Maximum axle-load, 19 metric tons. Minimum radius of curves, 300 m. Maximum gradient, 1 in 40 in both directions. Maximum distance between stations: 27 km. (*see under 'Miscellaneous'*).

Speed and capacity

Overall time (including stops): Eskişehir–Afyonkarahisar, passenger trains 4 hours, goods trains 5½ hours; Afyonkarahisar–Konya, passenger trains 6 hours, goods trains 10 hours. Capacity of line: 20 trains each way in 24 hours to Afyonkarahisar; 12 trains Afyonkarahisar–Konya.

Miscellaneous

Marshalling yards, engine-sheds, and locomotive repair shops at Eskişehir, Afyonkarahisar, Konya; engine-shed also at Alayunt. The repair shops at Eskişehir are next in importance to those at Sivas. There are a number of passing-loops ready for connexion to the line in an emergency: they are shown in the detailed description. When connected the maximum distance between passing-loops would be 18 km.

GENERAL DESCRIPTION

The line is part of the old Anatolian Railway. On leaving Eskişehir it takes the Porsuk valley upstream for about 15 miles, when it leaves the Porsuk to follow the Akkaya defile, where there are a number of engineering works. At Alayunt a branch line of the old railway was built to Kütahya, 6 miles distant; this is now part of Route 16, to Balikesir. Beyond Alayunt the line passes through the enclosed valley of the Çandirar tributary of the Porsuk, the Çekürler and Ağalar defiles necessitating several bridges and tunnels. Afyonkarahisar (often called merely Afyon) is in an extensive, cultivated

plain, marshy in spring, and is an important road and rail junction. Above the town rises a bare and almost perpendicular-sided rock about 650 feet high, on which was the Byzantine citadel of Acroënus (I, p. 162). The Çetinkaya Railway Institute is at Afyonkarahisar (photo. 54).

Beyond Afyonkarahisar the line follows the southern edge of the depression north of the Sultan Dağ, which is liable to much flooding, the borders of lakes Eber and Akşehir in particular being very variable. The main road keeps generally from 1 to 6 miles distant from the railway, and along higher ground to the south. There are few engineering works, other than culverts, small bridges, and embankments. The country is less open after Ażariköy, but beyond Sarayönü the line traverses an open level plain before turning south to cross the Boz Dağ at mile 245 (km. 394). The siding at the top of the pass was used to make up trains which had been divided at Pinarbaşi to climb the steep gradients on the south of the range. This now appears to be unnecessary owing to more powerful locomotives.

DETAILED DESCRIPTION

Km. from Eskişehir	*Stations and passing-loops*	*Remarks*
0·0	ESKIŞEHIR (7) (*Gaz.*)	Alt. 2,598 ft. (792 m.). 4 platform tracks. ES. (round-house, 8 roads); Tbl. (20 m.); W. (T. 60,000 gls.; spare T., Cr., SP.); RpS. (large); oil-storage tanks; G.; Cr.; SLP.; PL., MY., numerous Sdgs. (8,812 m.). Junction with Routes 2 (Haydarpaşa) and 3 (Ankara). Line ascends the winding Porsuk valley, roughly parallel to a chain of hills on left. Ruins of castle on right.
7·2	..	Steel girder bridge, span 30 m., at Hilâliahmer over Porsuk river.
7·3	HILÂLIAHMER (16)	PL. only.
14·6	..	PL. (disconnected).
19·4	..	Steel girder bridge, span 10 m.
21·2	..	Steel girder bridge, span 30 m., over Porsuk river.
23·4	GÖKÇEKISIK (22)	Alt. 2,694 ft. (821 m.). G.; Wb.; SLP.; PL.; 2 LS. (719 m.). Village lies to right under chalk cliffs.
25·5	..	Steel girder bridge, span 30 m., over Porsuk river. Line leaves the Porsuk valley and turns abruptly to enter Akkaya defile. Between km. 32 and 41 there are 11 girder bridges of about 15 m. span, 3 tunnels of 36 m., 50 m., and 60 m., and many smaller bridges and culverts. There is a disconnected PL. at km. 35·6.
43·4	..	Line enters the plain of Sabuncupinar.

Km. from Eskişehir	*Stations and passing-loops*	*Remarks*
45·2	SABUNCUPINAR (22)	Alt. 3,097 ft. (944 m.). W. (T. 13,000 gls.; Cr., SP., well); G.; Wb.; SLP.; PL., LS. (758 m.).
54·3	..	PL. (disconnected). Alt. 3,380 ft. (1,030 m.).
58·0	..	Sdgs. (disconnected).
66·9	ALAYUNT (19)	Alt. 3,041 ft. (927 m.). ES. (3 roads); Tbl. (13·5 m.); RpS. (light); W. (T. 8,000 gls.; Cr., SP., well); G.; SLP.; PL., 2 LS., short DES. (1,250 m.). Junction with Route 16 (Kütahya and Balikesir).
77·6	..	PL. (disconnected).
81·2	..	Girder bridge, span 10 m. Line enters the Çekürler defile, with cuttings and embankments and 2 more girder bridges, span 10 m.
85·5	ÇEKÜRLER (16)	Alt. 3,347 ft. (1,020 m.). W. (T. 11,000 gls.; Cr., SP., well); G.; Wb.; SLP.; PL., LS., DES. (867 m.). Station is on left bank of Akçemescid stream. Between here and Döger the line passes through a valley which becomes enclosed in places. There are a number of bridges and tunnels in the Ağalar defile. To the south is the Elmali Dağ.
101	DEĞIRMENÖZÜ (12)	PL. only.
113·1	DÖGER (15)	Alt. 3,665 ft. (1,117 m.). W. (T., 2 Cr., SP., well); G.; Wb.; SLP.; PL., LS. (824 m.). Line crosses marshy ground and then rises to the highest point of the route before descending rapidly over a plain.
127·9	IHSANIYE (14)	Alt. 3,593 ft. (1,095 m.). G.; Wb.; SLP.; PL., LS. (707 m.).
141·5	HAMAM (4)	Alt. 3,438 ft. (1,048 m.). PL. (440 m.). Baths close to station, with hot springs (*anc.* Aquae Germe?).
145·0	GAZLIGÖL (16)	Alt. 3,416 ft. (1,041 m.). W. (T. 9,000 gls.; Cr., SP., well); G.; SLP.; PL., DES. (891 m.). Line reaches the wide marshy plain of Afyonkarahisar and at km. 160·5 crosses the Dalay river by a solidly built steel bridge (3 × 10 m.).
161·2	AFYONKARAHISAR (AFYON ANA) (20) (*Gaz.*)	Alt. 3,307 ft. (1,008 m.). 3 platform tracks. ES. (round-house, 4 roads); Tbl. (20 m.); W. (T. 28,000 gls.; Cr., SP., well); RpS. (heavy); oil-storage tanks; G.; Wb.; SLP.; PL., LS., MY. (5), 3 DES. (3,370 m.). Junction with Routes 14 and 17 to Izmir. Line follows the main road and then crosses a treeless, level plain, watered by the Akar stream.
170·4	..	PL. (disconnected).
180·7	BÜYÜK ÇOBANLAR (27)	Alt. 3,255 ft. (992 m.). G.; Wb.; SLP.; PL., LS. (723 m.). Village is across the river to the north. Line and road diverge, latter keeping close to foothills of the Gölcük–Kizil Dağ on south side

Km. from Eskişehir	*Stations and passing-loops*	*Remarks*
		of valley. Line is embanked over marshy ground near the river and may be flooded in very wet weather. There are 4 girder bridges (spans of 10 m. or 20 m.) between B. Çobanlar and Çay.
194·2	..	PL. (disconnected).
207·5	ÇAY (26)	Alt. 3,205 ft. (977 m.). W. (T. 12,000 gls.; Cr., SP., well, spring); G.; Wb.; SLP.; PL., 2 LS. (1,182 m.).
		Çay town is 3 km. south of the station at foot of Sultan Dağ. Road to Bolvadin crosses the line by level crossing east of station.
		Line traverses marshy land, crossing small bridges. The Çay stream is crossed by a girder bridge (span 10 m.) near the south-west corner of Lake Eber. Line then passes along south shore of the lake.
220·2	..	PL. (disconnected).
233·6	ISHAKLI (13)	Alt. 3,200 ft. (975 m.). W. (Cr., SP., well); G.; Wb.; SLP.; PL., LS. (699 m.). Village is on the main road 2 km. south of station.
		Line and road converge at foot of Sultan Dağ to avoid marshes of Akşehir lake; there are several bridges over small streams.
246·9	YASYAN (12)	Alt. 3,170 ft. (966 m.). G.; SLP.; PL., LS. (725 m.). Station is near south-west corner of Akşehir lake; the ground near it is marshy and liable to flood.
259·2	AKŞEHIR (18) (*Gaz.*)	Alt. 3,274 ft. (998 m.). W. (T. 9,000 gls.; Cr., well); G.; Wb.; SLP.; PL., 3 LS. (1,365 m.). Town, 2 km. south, is connected by motorable road 30 ft. wide.
		Line diverges from Sultan Dağ, crosses a flat fertile plain. There are 3 bridges of 10 m. span, and 1 with 2 spans of 6 m.
277·6	AZARIKÖY (9)	Alt. 3,356 ft. (1,023 m.). G.; SLP.; PL., LS. (530 m.).
		Line rises over bare hills for 9 km. to alt. 3,573 ft. (1,089 m.), and descends the valley of the Kisik Köprü (Çepeşli Dere).
286·9	ARGITHAN (13)	Alt. 3,563 ft. (1,086 m.). PL., LS. (990 m.).
299·4	ÇAVUŞÇUKÖY (18)	Alt. 3,422 ft. (1,043 m.). W. (T., Cr., SP., well); G.; SLP.; PL. (487 m.?). Village is about 3 km. farther on by the Ilgin lake.
		After the village, the line turns south, following the edge of the lake for 8 km. before reaching the fertile Ilgin plain. The lake water is fresh and has many fish. The line crosses 3 bridges of 10 m. span or more.
316·9	ILGIN (27) (*Gaz.*)	Alt. 3,379 ft. (1,030 m.); Tbl. (13·5 m.); W. (T., 9,000 gls.; Cr., SP., well); G.; Wb.; SLP.; PL., 2 LS. (650 m.).

Km. from Eskişehir	*Stations and passing-loops*	*Remarks*
		District is malarious. Town, 2 km. distant, is connected by motorable road.
		Line and road now keep together, crossing each other twice; line passes through a narrow defile before Karaköy (16 km. from Ilgin), and then crosses bare open country to Kadinhan.
331·1	..	PL. (disconnected).
343·5	KADINHAN (24)	Alt. 3,383 ft. (1,031 m.). G.; Wb.; SLP.; PL., LS. (583 m.).
359·7	*Belier*	PL. only (disconnected).
367·5	SARAYÖNÜ (17)	Alt. 3,504 ft. (1,068 m.). Tbl.; W. (T. 9,000 gls.; spare T. 1,800 gls.; 2 Crs., well); G.; Wb.; SLP.; PL., LS., DES. (931 m.). Large storage sheds for grain. Village 2 km. to north.
		Line goes east over level plain, passes several small villages, rounds a hill, and turns south-east.
384·3	MEYDAN (10)	Alt. 3,488 ft. (1,063 m.). G.; SLP.; PL., LS. (436 m.). Station is in valley dominated by hills on south and west. Country becomes fertile and cultivated. Village is about 4 km. to south-west.
394·0	BOZDAĞ (17)	Alt. 3,714 ft. (1,132 m.). PL., DES. (559 m.).
		Line zigzags up the flank of the Boz Dağ, enters a defile, and climbs to the Boz Dağ pass.
		Alt. 4,373 ft. (1,333 m.). Siding at summit of pass (disused). Line winds down to the plain of Konya.
405	..	PL. (disconnected).
411·3	PINARBAŞI (22)	Alt. 3,304 ft. (1,007 m.). W. (T. 9,000 gls.; S.P., well); G.; SLP.; PL., LS. (816 m.).
		The line crosses the Konya plain, which is liable to inundation in winter. A girder bridge (span 10 m.) is crossed at km. 411·9.
424·5	..	PL. (disconnected).
433·7	KONYA (*Gaz.*)	Alt. 3,373 ft. (1,028 m.). ES. (round-house, 8–10 roads); Tbl. (20 m.); W. (T. 26,000 gls.; Cr., SP., well); RpS. (heavy); G.; Wb.; SLP.; PL., MY. (7), 4 DES. (4,673 m.).

9. KONYA–ADANA–ALEPPO

(*Completed 1918; see page 247*)

Route

Konya–Ulukişla	147·6 miles	237·6 kilometres
Ulukişla–Adana	82·3 ,,	132·4 ,,
Adana–Toprakkale	48·7 ,,	78·3 ,,
Toprakkale–Fevzipaşa	39·2 ,,	63·1 ,,
Fevzipaşa–Aleppo	95·6 ,,	153·8 ,,
	413·4	665·2

Junctions

The line from Ankara and Kayseri (Route 10) joins at Kardeşgediği, mile 145 (km. 233). Yenice, mile 215 (km. 346), is the junction for the Mersin–Adana line (Route 19); Toprakkale, mile 278 (km. 448), for the line leading to Iskenderon (Route 20); Fevzipaşa, mile 318 (km. 511), for the line to Malatya and Diyarbekir (Route 22). Aleppo is the junction for Syrian railways, and for the line to Nusaybin and Iraq (Route 21).

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, wooden to Yenice; thence steel to Meydaniekbez. Maximum axle-load, 20 metric tons to Fevzipaşa; thence 19 m.t. to Aleppo. Minimum radius of curves, 300 m. Maximum gradient, 1 in 40. Maximum distance between stations: 29 km.

Speed and capacity

Overall time (including stops): Konya–Ulukişla, 7 hours (passenger trains), 10 hours (goods); Ulukişla-Adana, 3½ hours (passenger), 6 hours (goods); Adana–Fevzipaşa, 3½ hours (passenger), 6 hours (goods); Fevzipaşa–Aleppo, 5 hours (passenger), 8 hours (goods). Capacity of line: Konya–Adana: 12 trains each way in 24 hours; Adana–Aleppo: 9 trains.

Miscellaneous

Marshalling yards: Konya, Ulukişla, Yenice, Adana, Toprakkale, Fevzipaşa, Aleppo. Engine-sheds: Konya, Karaman, Ereğli, Ulukişla, Pozanti, Adana, Toprakkale, Mamure, Fevzipaşa, Meydaniekbez, Muslimiye (Syria), Aleppo. Locomotive repair shops: Konya, Ereğli, Adana, Fevzipaşa, Aleppo. There are a number of disconnected passing-loops which may be brought into use in an emergency.

GENERAL DESCRIPTION

The line is part of the old German-built Baghdad railway.

Konya–Ulukişla. The line first runs south-east across the open, irrigated Konya plain for about 39 miles, when the hills begin to close in, and for the next 12 miles it traverses a broad depression with the undulating Taurus foothills on the south and the lava-fringe of the old Kara Dağ volcano on the north. It retains the same general direction into the Karaman plain, but at Karaman bends sharply north-east with the change in direction of the Taurus. The line still

passes through depressed open country, with foothills on the south-east, and generally plain to the north-west as far as Sidrova, soon after which it enters the foothills, where there are a few more engineering works. From Alaca to Ereğli it keeps to the foothill edge, but from Çayhan it begins to bend into the Taurus and climbs to the watershed at Kardeşgediği, where the main line from Ankara joins it from the north. Less than 3 miles beyond the junction is the station of Ulukişla. The rise from Çayhan to Kardeşgediği is about 1,100 feet in 10·8 miles.

Ulukişla–Adana. The descent through the Taurus begins at Ulukişla, and is much longer than the ascent from the plateau, the fall from Kardeşgediği to Durak being 4,320 feet in 59 miles of track. An almost continuous succession of engineering works, large and small, mark the descent. The line leaves the historic route to the Cilician Gates at Pozanti and continues on through the canyon of the Çakit. It is here that the greatest difficulties had to be overcome, and there are 7·3 miles of tunnelling in 9·2 miles of track between Karapinar and Hacikiri, while most of the rest is built up into the hillside with numerous bridges and culverts. The gradient eases after Durak and the line descends a valley with hills about 200 feet high on either side, to the Seyhan plain near Yenice, where it is joined by the old Mersin–Adana line.

Adana–Aleppo. Across the Seyhan lowland there are no serious obstacles to the line except the two rivers, the Seyhan and Ceyhan. These are well bridged at Adana and near Çakaldere, north of Misis. These two bridges are only 30 and 15 miles from the coast respectively. Toprakkale, the junction for the line to Iskenderon, is only 12 miles from the head of the Gulf of Iskenderon. Beyond Toprakkale the climb towards the Gâvur Dağ begins, at first gradually, then after Mamure more steeply and with many small tunnels and other works to Ayran. The main 'Amanus' tunnel, 3 miles long, pierces the range just beyond this station, and on the far side of it Fevzipaşa has become an important rail and road junction.

The eastern slopes of the Gâvur Dağ are less difficult than the western. From Islâhiye to the Syrian boundary the line goes south-east in an open valley with easy gradients and few engineering works. Beyond the boundary it skirts the Kurt Dağ, bends east to Raju, and descends a cultivated valley between rocky bush-covered uplands, with a gradient of 1 in 50 in places. There is considerable difficulty between Raju and Katma, but from Katma onwards the country is much easier, with a gentle descent to Aleppo.

DETAILED DESCRIPTION

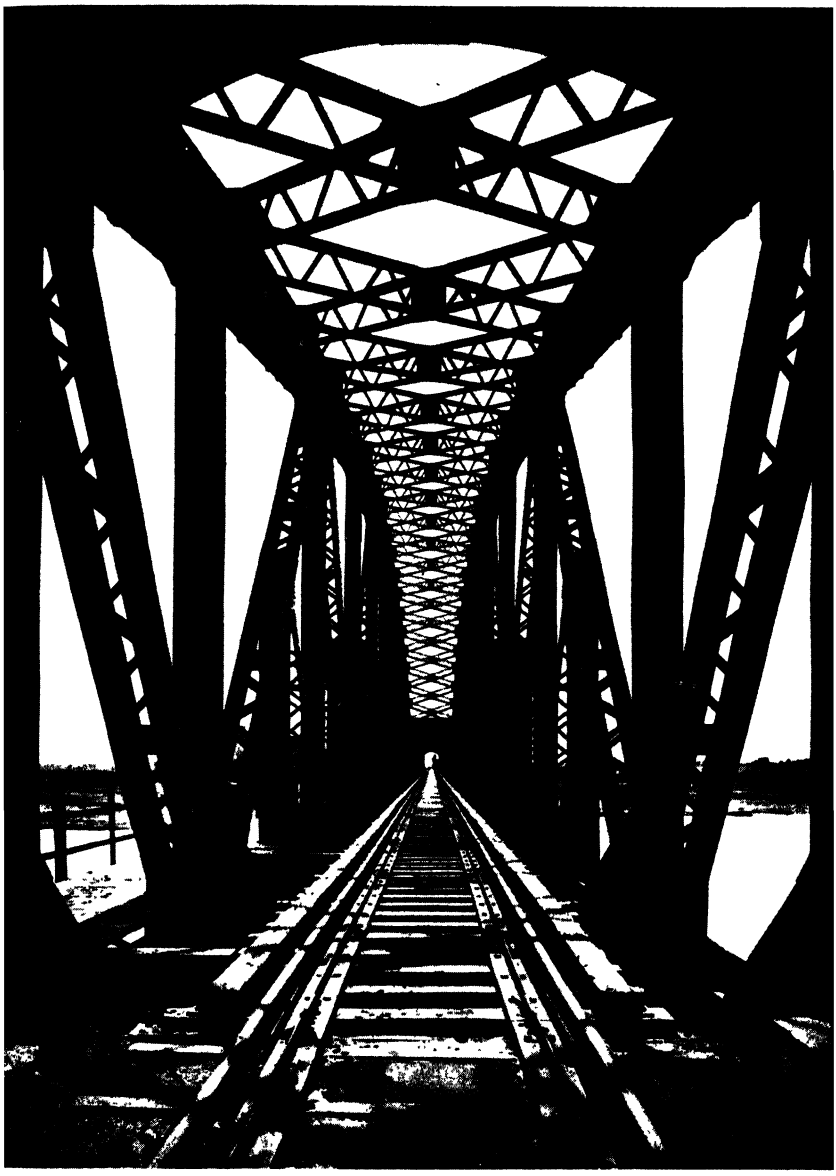
Km. from Konya	*Stations and passing-loops*	*Remarks*
0·0	KONYA (20) (*Gaz.*)	Alt. 3,373 ft. (1,028 m.). ES. (round-house, 8–10 roads); Tbl. (20 m.); W. (T. 26,000 gls.; Cr., SP., well); RpS. (heavy); G., Wb.; SLP.; PL., MY. (7), 4 DES. (4,673 m.). Line runs south-east over open flat plain.
10·3	..	PL. (disconnected).
13·0	..	Plate-girder bridge, span 15 m.
20·4	KAŞINHAN (24)	Alt. 3,333 ft. (1,016 m.). G.; SLP.; PL., DES. (563 m.).
30·2	..	Lattice-girder bridge, span 25 m., over irrigation canal.
32·3	..	PL. (disconnected).
39·2	..	Steel bridge, span 16 m.
44·2	ÇUMRA (18)	Alt. 3,327 ft. (1,014 m.). W. (T. 13,000 gls.; Cr.); G.; Wb.; SLP.; PL., LS. (804 m.).
46·3	..	Steel lattice-girder bridge, span 25 m., over Çarşamba.
53·0	..	PL. (disconnected).
61·9	ARIKÖREN (19)	Alt. 3,350 ft. (1,021 m.). W. (Cr.); G.; Wb.; SLP.; ELP.; PL., DES. (638 m.).
70·7	..	PL. (disconnected). Line passes between volcanic Kara Dağ and Taurus foothills.
80·7	MANDASUN (22)	Alt. 3,330 ft. (1,015 m.). G.; SLP.; PL., LS. (676 m.). Line passes along open valley 7 km. wide into the plain of Karaman.
91·5	..	PL. (disconnected).
102·3	KARAMAN (17) (*Gaz.*)	Alt. 3,360 ft. (1,024 m.). ES. (round house, disused); Tbl.; W. (T. 12,000 gls.; Cr., SP.); G.; Wb.; SLP.; cattle-ramp; PL., 2 LS. (1,431 m.). Line turns sharply north-eastwards and runs straight across open plain.
119·0	SIDROVA (29)	Or Sidirva. Alt. 3,346 ft. (1,020 m.). G.; SLP.; PL., LS. (804 m.).
135·0	..	PL. (disconnected).
147·9	AYRANCIDERBENT (24)	Alt. 3,790 ft. (1,155 m.). W. (T. 12,000 gls.; Cr.); G.; Wb.; SLP.; PL., SL. (804 m.). Line approaches the Taurus foothills.
148·5	..	Bridge (2×8 m.) over Dicle (Koca) stream. Line passes through broken foothills.
160·0	..	Line begins gentle descent in open cultivated valley.
162·1	..	PL. (disconnected).
166·8	..	Plate-girder bridge (5×6 m.). Down gradient 1 in 77 for 5 km. in valley. Line reaches plain, 16 to 24 km. wide, with Ak Göl and Sazlik Göl marshes to the north.
172·0	ALACA (7)	Alt. 3,406 ft. (1,038 m.). G.; SLP.; PL., LS. (593 m.). Line passes extensive marshes on the north.

Km. from Konya	*Stations and passing-loops*	*Remarks*
180·3	..	PL. (disconnected).
188·5	..	Steel lattice-girder bridge, span 25 m.
189·2	EREĞLI (10) (*Gaz.*)	Alt. 3,491 ft. (1,064 m.). ES. (round-house, 4 roads); Tbl.; W. (T. 13,000 gls.; Cr., SP., well); RpS. (heavy); G.; Wb.; SLP.; PL., 3 LS., DES. (1,732 m.).
191·5	..	Lattice-girder bridge, span 25 m., over Ivriz stream.
198·9	BULGARLU (17)	Alt. 3,461 ft. (1,055 m.). G.; SLP.; PL. (349 m.). Line begins gradual bend eastwards.
205·3	..	PL. (disconnected). As line begins to ascend along north-west edge of Taurus foothills, culverts and other small engineering works become more frequent. There are about
213·1	..	35 culverts and 1 steel and concrete bridge (2 × 10 m.).
215·9	ÇAYHAN (17)	Or Çakmak. Alt. 3,675 ft. (1,120 m.). W. (T. 12,000 gls.; Cr.); G.; Wb.; PL., LS. (876 m.). Line bends east-south-east, first through undulating country, then climbs the side of a ridge with gradient increasing to 1 in 40. It crosses many small gullies cut in soft limestone. Many culverts, cuttings, and small embankments, and 2 bridges (span 4 m.) are necessary.
224·3	..	PL. (disconnected).
233·2	..	Col. Alt. 4,816 ft. (1,468 m.). From this col the country traversed appears open and undulating, falling easily to the open plateau.
233·3	KARDEŞGEDIĞI (4)	Alt. 4,816 ft. (1,468 m.). G.; PL., LS. (730 m.). Junction with main line from Ankara and Kayseri (Route 10). Line begins descent of Çanak (Çakra), headstream of Çakit. Valley narrows and line descends with gradients up to 1 in 50.
237·6	ULUKIŞLA (28) (*Gaz.*)	Alt. 4,679 ft. (1,426 m.). ES. (4 roads); Tbl. (17·7 m.); W. (T. 12,000 gls.; Cr., SP.); G.; Cr.; Wb.; SLP.; cattle-ramp; PL., MY. (5) (2,720 m.). Junction station for route 10. From here to Karapinar (km. 291·2) there are numerous bridges and tunnels during the descent through the limestone rocks of the Taurus. Tunnels are lined. Bridges of spans less than 10 m., culverts, and small works are omitted below.
251·2	..	Bridge, span 10 m.
252·3	*Gümüş*	PL. (disconnected).
c. 257–8	..	2 bridges, span 16 m.
c. 260	..	2 bridges (2 × 8 m.); 1 bridge, span 15 m.
260·7	..	Tunnel (191 m.).
c. 261	..	Bridge (2 × 8 m.).
261·5–263·4	..	6 tunnels (120 m., 63 m., 146 m., 58 m., 154 m., 80 m.).

Km. from Konya	*Stations and passing-loops*	*Remarks*
266·0	ÇIFTEHAN (16)	Alt. 3,114 ft. (949 m.). W. (T. 12,000 gls.; Cr., SP.); G.; PL., SLP. (890 m.).
267·1	..	Tunnel (57 m.).
267·3	..	Bridge, span 20 m.
268·1	..	Tunnel (61 m.).
270·7	..	Bridge (2 × 10 m.).
271·4	..	Tunnel (103 m.).
271·9	..	Tunnel (29 m.).
275·2	..	Concrete bridge, span 10 m.
275·4	..	Tunnel (109 m.).
275·8	..	Bridge (2 × 8 m.) and tunnel (38 m.).
275·9	..	Bridge, span 14 m.
277·3	..	Tunnel (87 m.).
279·9	..	Bridge, span 10 m.
280·0	..	Tunnel (67 m.).
281·6	POZANTI (10)	Alt. 2,556 ft. (779 m.). ES. (2 roads); Tbl. (20·1 m.); W. (T. 10,000 gls.; Cr.); G.; Cr.; Wb.; SLP.; PL., LS., several Sdgs. (1,062 m.). Station is on right bank of Çakit, bed of which is between 100 and 200 m. wide and shingly. Pine-clad mountains rise 1,000 m. above the valley bottom. Road and telegraph leave the railway here for the Cilician Gates. Line continues to follow Çakit valley. Engineering works are numerous, with frequent stone-faced embankments, and many culverts.
283·9	..	Bridge (3 × 6 m.).
285·9–287·0	..	4 Tunnels (50 m., 86 m., 56 m., 217 m.).
291·2	KARAPINAR (3)	Alt. 2,316 ft. (706 m.). Station is only a few metres above the stream. G.; PL., DES. (1,460 m.) are about 1 km. south of station and connected by special line. From here the line runs in an almost continuous succession of tunnels large and small, to Hacikiri, with small bridges between them over side-ravines.
292·9	..	Tunnel (1,726 m.).
294·3	BELEMEDIK (12)	W. (T. 12,000 gls.; Cr.); SLP.; PL., DES.
294·8	..	Tunnel (711 m.).
295·6	..	Bridge (33 m. + 6 m.), and tunnel (603 m.).
296·2	..	Bridge, span 18 m., and tunnel (37 m.).
296·4	..	Tunnel (540 m.).
297·1	..	Tunnel (237 m.).
297·3	..	Bridge, span 20 m.
297·4	..	Tunnel (136 m.).
297·5	..	Bridge, span 20 m.
297·6	..	Tunnel (1,220 m.).
298·9	..	Bridge (12 m. + 2 × 10 m.).
299·0	..	Tunnel (554 m.).
299·4	..	Bridge (2 × 18 m. + 10 m.).
299·5	..	Tunnel (3,795 m.).
303·3	..	Two masonry bridges (33 m. + 10 × 5 m.); (26 m. + 10 × 5 m.).

Km. from Konya	*Stations and passing-loops*	*Remarks*
303·5	..	Tunnel (165 m.).
303·7	..	Masonry bridge (30 m.+10 m.+4 m.+7 m.).
303·8	..	Tunnel (2,093 m.).
306·1	HACIKIRI (9)	Alt. 1,913 ft. (583 m.). W. (T. 12,000 gls.; Cr.); G.; SLP.; PL., LS. (995 m.). Station is close to last long tunnel.
		From now on, the gradient steepens, and there is much embanking, but drainage is mainly by small culverts. The only large works are the Gidur viaduct and one tunnel.
307·3	..	Gidur viaduct: length 215 m. (6 m.+3×12 m.+3×30 m.+4×10 m.): 69 m. high; masonry piers.
314·0	..	Tunnel (220 m.).
315·4	BUCAK (13)	Alt. 1,289 ft. (393 m.). PL. only (490 m.).
		Gradient is still severe, with many small works as the line descends to the Seyhan plain.
317·2	..	Viaduct: length 50 m. (15 m.+20 m.+15 m.).
317·6–321·5	..	5 tunnels (110 m., 155 m., 115 m., 150 m., 45 m.).
323·2	*Kelbek*	Alt. 804 ft. (245 m.). G.; SLP.; no PL.
		There are no large works from here onwards and only a few bridges (noted below) with spans of 10 m. or more.
327·3	..	Concrete bridge, span 10 m.
328·1	DURAK (18)	Alt. 486 ft. (148 m.). G.; SLP.; PL., LS. (973 m.).
	..	Gradient eases to 1 in 100. There are still several small bridges and culverts, but few of 10 m. span.
329·5	..	Concrete bridge (2×10 m.).
331·5	..	Bridge, span 10 m.
332·0	..	Bridge (2×5 m.).
332·2	..	Bridge, span 10 m.
346·0	YENICE (8)	Alt. 112 ft. (34 m.). Tbl. (20 m.); W. (T. 9,000 gls.; Cr.; SP.); G.; Wb.; Cr.; SLP.; PL., LS., MY. (3) (2,281 m.). Junction with Mersin line (Route 19).
		Line turns east across the Seyhan plain, crossing 4 small bridges.
348·5	*Arikli*	Halt; no PL.
		Line crosses 6 small bridges.
354·0	ZEYTINLI (9)	Alt. 92 ft. (28 m.). G.; PL., DES. (611 m.).
		Line crosses 3 small bridges.
357·3	*Dikili*	Halt; no PL.
		Line crosses 6 small bridges.
363·1	YEŞILOVA (4)	Formerly Kâhyaoğlu. Alt. 92 ft. (28 m.); G.; PL., LS. (491 m.).
		Line crosses 5 small bridges.
367·4	ŞAKIRPAŞA (3)	Alt. 79 ft. (24 m.). PL. (232 m.).
369·6	..	Bridge (2×5 m.).
370·0	ADANA GAR (11) (*Gaz.*)	Alt. 95 ft. (29 m.). Large first-class station about 3 km. north of the town. ES. (round-house, 4 roads); Tbl. (20 m.); RpS. (heavy); W. (T., Cr., SP., well); G.; Wb.; SLP.; PL., LS., MY. (5)

Km. from Konya	*Stations and passing-loops*	*Remarks*
		(3,734 m.). Junction with branch (1·9 km. SE.) to Adana S., old terminus of Mersin line: G.; Wb.; LS., 6 DES. (1,033 m.).
		The line crosses the Seyhan plain to Misis. Between Adana and Incirlik there are 3 small bridges with spans of less than 10 m., besides those noted below.
371·3	..	Lattice-girder bridge (4×54 m.+96 m.) over Seyhan; masonry piers founded on oak piles driven in sheet piling coffer dams (photo. 81).
374·8	..	Bridge, span 10 m.
380·8	INCIRLIK (9)	Alt. 174 ft. (53 m.). G.; ELP.; PL. (310 m.).
		3 small bridges.
389·5	KÜRKÇÜLER (7) (GÜRCÜLER)	Alt. 174 ft. (53 m.). ELP.; PL., LS.
		2 small bridges.
392·8	*Acidere*	Halt only.
		1 small bridge.
396·8	MISIS (21)	Alt. 177 ft. (54 m.). W. (Cr.); G.; ELP.; PL., LS. (771 m.?).
		Line turns north-east along Ceyhan river.
		1 small bridge.
404·2	*Çakaldere*	Halt only.
		Small bridge.
406·5	..	Line crosses Ceyhan by large steel lattice-girder bridge (4×50 m.), and then keeps between the river and Misis hills, crossing 1 small bridge.
413·6	*Sirkeliköy*	Halt only.
417·9	CEYHAN (13) (*Gaz.*)	Alt. 98 ft. (30 m.). W. (Cr.); G.; Wb.; ELP.; PL., 2 LS., short DES. (818 m.).
		Line leaves Ceyhan river.
430·8	VEYSIYE (18)	Alt. 115 ft. (35 m.). G.; ELP.; PL., LS. (472 m.).
434·0	*Yassicaköy*	Halt only.
435·5	..	Bridge, span 10 m.
442·0	*Mustafabey*	Or Mustafapaşa. Halt; possibly a PL.
448·3	TOPRAKKALE (9)	Alt. 213 ft. (65 m.). ES. (3 roads); Tbl. (20 m.); W. (T. 12,000 gls.; Cr., SP., well); RpS. (light); G.; Wb.; ELP.; PL., MY. (5), DES. (2,853 m.).
		Junction with line to Iskenderon (Route 20).
		Line passes through valley with easy gradients.
457·3	OSMANIYE (10) (*Gaz.*)	Alt. 377 ft. (115 m.). G.; ELP.; PL., LS., DES. (800 m.).
		Line passes through open country for 6 km.
465·2	..	Girder bridge, span 15 m.
465·7	..	Plate-girder bridge, span 20 m.
466·9	MAMURE (4)	Alt. 400 ft. (122 m.). ES. (3 roads); Tbl. (20 m.); RpS. (light); W. (T. 14,000 gls.; Cr., SP., well); G.; Wb.; SLP.; PL., 3 LS. (1,568 m.).
		Line continues to ascend with gradient increasing to 1 in 42.
471·3	PL. (22)	PL. on curve. Alt. 643 ft. (196 m.).
472·3	..	Bridge (12 m.+14 m.+12 m.).



81. *Bridge over the Seyhan river at Adana, km. 371·3, Konya–Aleppo railway*

Km. from Konya	*Stations and passing-loops*	*Remarks*
473·3	..	Bridge (3 × 9 m.).
		Valley narrows to a gorge, line following its north side well above stream-level. Sides of gorge about 150 m. high, cut by ravines. Very heavy earthwork, cuttings, bridges, and tunnels. Line with maximum gradient of 1 in 40 gradually approaches valley bottom at end of gorge, about km. 484. Only the most important works are noted below.
477·2	..	Viaduct, span 40 m.
477·4	..	Viaduct (10 m. + 50 m. + 10 m.).
477·9	..	Tunnel (1,014 m.).
479·4	*Yarbaşi*	Halt. No PL.
480·5–485·0	..	7 tunnels (176 m., 216 m., 427 m., 121 m., 105 m., 230 m., 432 m.).
485·9	..	PL. (probably dismantled), alt. 1,683 ft. (513 m.) near river-level. Line enters upper Hamis valley, about 500 m. broad, which gradually widens towards Bahçe.
493·0	BAHÇE (18)	Alt. 1,837 ft. (560 m.). W. (T. 12,000 gls.; Cr., SP.); G.; ELP.; PL., LS. (840 m.).
		Line bends east up Hamis valley, which again narrows to a gorge. Line follows the stream for about 500 m. on its north bank, crossing the Bülanik stream near Bahçe village. Gradient is 1 in 40 to Ayran; tunnelling and bridging are not heavy, but there are frequent cuttings and stone-faced embankments.
493·6	..	Steel bridge (2 × 8 m.).
495·3	..	Viaduct (10 × 9 m.).
496·0	..	2 tunnels (113 m., 140 m.).
500·8	*Ayran*	Halt. No PL. Alt. 2,408 ft. (734 m.). Halt is near the west entrance to the 'Amanus' tunnel.
500·9	..	Bridge span 12 m.
501·1	..	Line passes into the 'Amanus' tunnel (4,905 m.) to cross the Gâvur Dağ. In the first 2¼ km. it rises to 2,431 ft. (741 m.), and then descends to its eastern exit. Entrance is at 2,411 ft. (735 m.), exit at 2,375 ft. (724 m.). Descent beyond begins at 1 in 40.
506–9	..	4 tunnels (67 m., 166 m., 340 m., 535 m.).
511·4	FEVZIPAŞA (9)	Alt. 1,995 ft. (608 m.). ES. (round house, 5 roads); Tbl. (20 m.); RpS. (heavy); W. (T. 50,000 gls.; 3 Cr., SP., well); coal-stacks; G.; Wb.; SLP.; ELP.; PL., MY. (5), Sdgs. (3,160 m.). Junction with line to Malatya and Diyarbekir (Route 22). Fevzipaşa is also an important road centre.
		Line turns south and continues descent with decreasing gradient. Earthwork is considerable, but less than on other side of Gâvur Dağ.
520·8	ISLÂHIYE (27)	Alt. 1,617 ft. (493 m.). W. (T. 12,000 gls.; Cr., SP., well); G.; ELP.; PL., LS. (1,593 m.).

Km. from Konya	*Stations and passing-loops*	*Remarks*
		Line runs south over open marshy plain passing through 2 small tunnels and crossing 4 bridges, including a large one over the Kara Su.
545·9	..	Syrian boundary.
548·0	Meydanikbez (20)	Alt. 1,358 ft. (414 m.). ES.; Tbl. (20 m.); W. (T. 12,000 gls.; Cr., SP.); G.; Wb.; ELP.; PL., 2 LS. Syrian customs post. Henceforward the line to Aleppo is in Syria (for details *see* Syrian Handbook).
568·0	Raju (13)	Alt. 1,890 ft. (576 m.). PL., DES.
581·0	PL. (12)	PL. only.
593·2	Kurt Kulak (18)	Alt. *c.* 950 ft. (*c.* 290 m.). W. (T. 6,600 gls.; Cr., SP.); PL., DES.
611·0	Katma (17)	Alt. 2,024 ft. (617 m.). W. (T. 6,600 gls.; Cr., SP.); PL., DES.
628·4	Tel Rifat (23)	PL., DES.
651·5	Muslimiye (14)	Alt. *c.* 1,575 ft. (*c.* 480 m.). ES. (2 roads); Tbl. (15·5 m.); RpS. (light); W. (T. 6,600 gls.; 2 Cr., SP., well); PL., MY. (5). Junction with line to Nusaybin (Route 21).
665·2	Aleppo	Alt. 1,358 ft. (414 m.). ES. (round-house); Tbl.; RpS.; coal-stack; W. (T., Cr.); G.; MY. (7), numerous Sdgs.

10. KAYSERI–ULUKIŞLA (BOĞAZKÖPRÜ–KARDEŞGEDIĞI)

(*Completed 1933; see page 254*)

Route

Kayseri–Ulukişla	118·8 miles	191·1 kilometres
(Boğazköprü–Kardeşgediği	106·8 „	171·8 „)

Junctions

Boğazköprü is the junction with Route 4 (to Ankara); Kardeşgediği the junction on the Konya–Adana line (Route 9).

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, steel. Maximum axle-load, 20 metric tons. Minimum radius of curves, 300 m. Maximum gradient, 1 in 62. Maximum distance between stations, 18 km.

Speed and capacity

Overall time (including stops): passenger trains 4 hours; goods trains 7 hours. Capacity of line: 13 trains each way in 24 hours.

Miscellaneous

Marshalling yards at Kayseri, Boğazköprü, Ulukişla. Engine-sheds at Kayseri and Ulukişla; locomotive repair shops at Kayseri (heavy).

GENERAL DESCRIPTION

This line is the link between the northern plateau trunk lines, from Eskişehir through Ankara and Sivas to Erzurum, and the old Baghdad railway. It is of great importance, for it connects Ankara with the Mediterranean coast. Since it was completed in 1933 the Taurus Express has followed it in preference to the old route by Konya.

The line leaves the Ankara–Kayseri railway immediately west of Boğazköprü station, crosses the Sarmisakli river, and skirts the marshlands of the Sazlik Göl, passing through some broken country before reaching Incesu station, which is about 2 miles east of the large stone-built village of that name. It keeps almost level over long stretches along the eastern edge of the strange region of volcanic tuff, which is centred about 25 miles farther west on Ürgüp (I, p. 166). The line then crosses the western edge of the open plain of Karahisar Ovasi, occupied in the east by the lake and marshes of Sultansazliği, which vary much in extent according to the season. Develi Karahisar is dominated by an old fortress (*anc.* Tyana), strongly built on volcanic rock, and the line winds through a narrow valley to Arapli, passing over several small bridges and through short tunnels in the Biçem gorge. Between Arapli and Niğde there are no difficulties, the line traversing the open Misli plain. The gardens and vegetation of Niğde are in marked contrast with the aridity farther south. Between Niğde and Bor the country is broken and in the hills to the east there are marble quarries; but southwards the monotonous uncultivated semi-desert of the plateau stretches uninterruptedly to the west. South of Bereket the gradual ascent of the Taurus begins, the ruling gradient being about 1 in 62. It is known that there are many culverts throughout, especially in this last section, but there are few large bridges; the details of these are not available and the summary below only lists the stations and their facilities.

DETAILED DESCRIPTION

Km. from Kayseri	*Stations and passing-loops*	*Remarks*
0·0	KAYSERI (15) (*Gaz.*)	Alt. 3,440 ft. (1,049 m.). ES. (2 roads); Tbl.; W. (T. 55,000 gls.; 3 Cr.); G.; Wb.; SLP.; ELP.; MY. and numerous sdgs. (3,751 m.). On Routes 4 and 5.
15·0	BOĞAZKÖPRÜ (18)	Alt. 3,400 ft. (1,037 m.). G.; SLP.; ELP.; PL., small MY. (3) (2,222 m.). Junction with Route 4.
33·0	INCESU (17) (*Gaz.*)	Alt. 3,517 ft. (1,072 m.). W. (T. 12,000 gls.; Cr.); G.; PL. (419 m.); LS.
49·9	BAŞKÖY (15)	Alt. 3,690 ft. (1,125 m.). G.; ELP.; SLP.; PL. (419 m.); LS.
64·5	DEVELI KARAHISAR (18)	Alt. 3,740 ft. (1,140 m.). G.; ELP.; PL. (419 m.); LS.
75·9	..	PL. (disconnected).
82·6	ARAPLI (15)	Alt. 4,377 ft. (1,334 m.). G.; PL. (419 m.); LS.
97·6	HÜYÜK (17)	Alt. 4,462 ft. (1,360 m.). ELP.; PL. (419 m.); LS.
114·7	ANDAVAL (13)	Alt. 4,340 ft. (1,323 m.). PL. (419 m.) only.
127·7	NIĞDE (14) (*Gaz.*)	Alt. 3,990 ft. (1,216 m.). W. (T. 12,000 gls.; Cr.); G.; Wb.; SLP.; ELP.; PL. (419 m.); 2 LS.
141·4	BOR (15) (*Gaz.*)	Alt. 3,720 ft. (1,134 m.). G.; Wb.; SLP.; PL. (419 m.); LS.; DES.
156·7	BEREKET (18)	Alt. 3,547 ft. (1,081 m.). G.; PL. (419 m.); LS.
166·0	..	PL. (disconnected).
174·6	KARALAR (12)	Alt. 4,278 ft. (1,304 m.). G.; PL. (419 m.); DES.
186·8	KARDEŞGEDIĞI (4)	Alt. 4,816 ft. (1,468 m.). G.; PL., LS. (730 m.). Junction with Route 9 (Konya–Adana).
191·1	ULUKIŞLA (*Gaz.*)	Alt. 4,679 ft. (1,426 m.). ES. (4 roads); Tbl. (17·7 m.); W. (T. 12,000 gls.; Cr., SP.); G.; Cr.; Wb.; SLP.; cattle-ramp; PL., MY. (5) (2,720 m.). On Route 9.

11. IRMAK–FILYOS–ZONGULDAK

(*Completed 1937; see page 254*)

Route

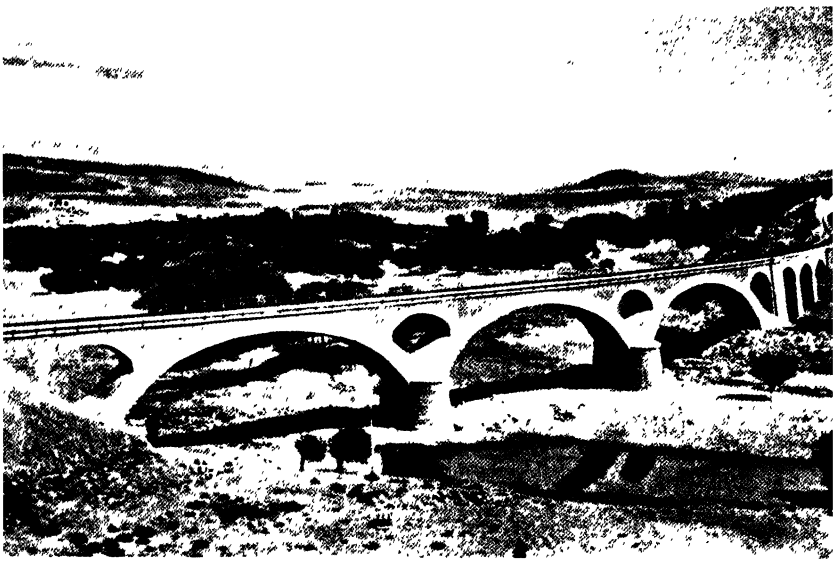
Irmak–Çankiri	63·6 miles	102·3 kilometres
Çankiri–Ismetpaşa	80·8 ,,	130·0 ,,
Ismetpaşa–Zonguldak	113·7 ,,	183·0 ,,
	258·1	415·3

Permanent way and stations

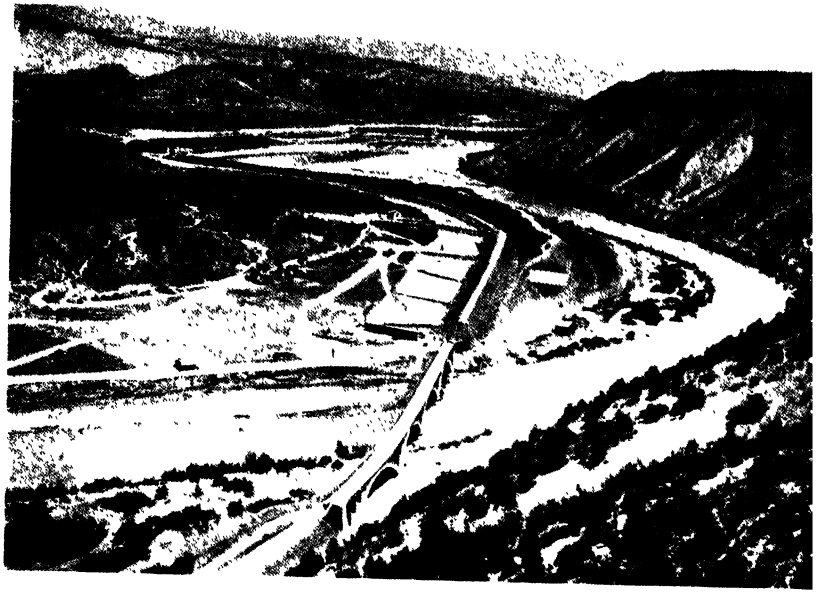
Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, steel and beech creosoted. Maximum axle-



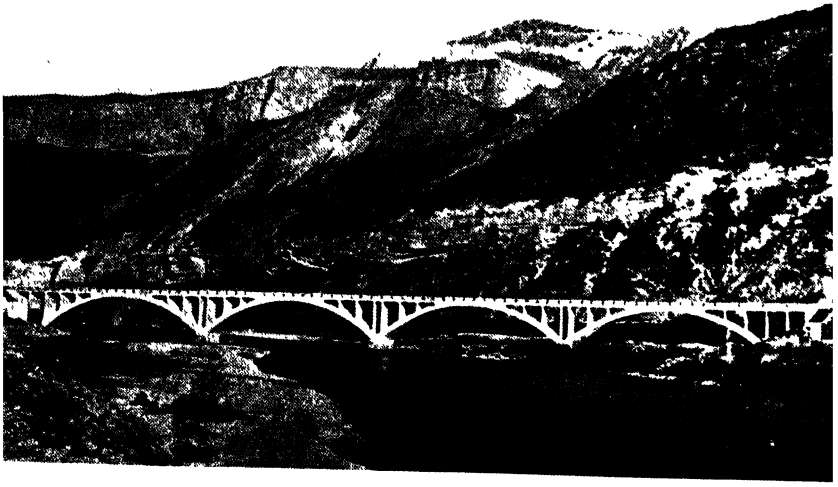
82. *Çankiri station, at km. 102·3, Irmak–Zonguldak railway*



83. *Devrez bridge, at km. 159·6, Irmak–Zonguldak railway*



84. *Yenice (Soğanli, Filyos) valley at Karabük. View at about km. 295, during construction of Irmak–Zonguldak railway*



85. *Reinforced concrete bridge over Soğanli (Yenice) river, km. 295·4, Irmak–Zonguldak railway. The first of 6 bridges over the river in the next 15 miles*

load, 20 metric tons. Minimum radius of curves, 250 m. (frequent). Maximum gradient, 1 in 50 in both directions. Maximum distance between stations, 21 km.

Speed and capacity

Overall time (including stops): passenger trains 12½ hours; goods trains 15½ hours. Capacity of line: 12 trains in each direction in 24 hours.

Miscellaneous

Marshalling yards at Irmak and Zonguldak. Engine-sheds at Irmak, Çankiri, Ismetpaşa, Filyos, at which light repairs can be undertaken.

GENERAL DESCRIPTION

This line connects Ankara as directly as possible with the Black Sea Coast, serving the port of Zonguldak and the coal district of which Ereğli is the centre, and also the holiday resort at Filyos. Geographically, it shows a typical cross-section of the country from the Central Plateau east of Ankara northwards to the Black Sea, the change of landscape being well illustrated by the photographs.

Irmak–Çankiri. The line leaves the Ankara–Kayseri trunk line at Irmak, 44 miles (70 km.) east of Ankara in a side valley of the Kizil Irmak, and it follows the left bank of this river across the plateau for about 25 miles before using its two tributaries the Tüney and Aci (or Çankiri) to reach Çankiri town. In this section the line never rises above 2,632 feet or falls below 1,970 feet; it is therefore well below the general level of the plateau throughout, and passes through bleak, barren country, with few trees and little cultivation except along the rivers and at settlements. Bare hills, snow-covered in winter, rise from the plateau, but there is more cultivation as Çankiri is approached. There were few engineering difficulties, but a number of moderate-sized bridges and a good deal of embanking and protective work were necessary.

Çankiri–Ismetpaşa. In this section the line crosses the plateau block between the sunken valleys of the Kizil Irmak and Devrez, and then follows the line of the latter and of the upper Ulu Su westwards.

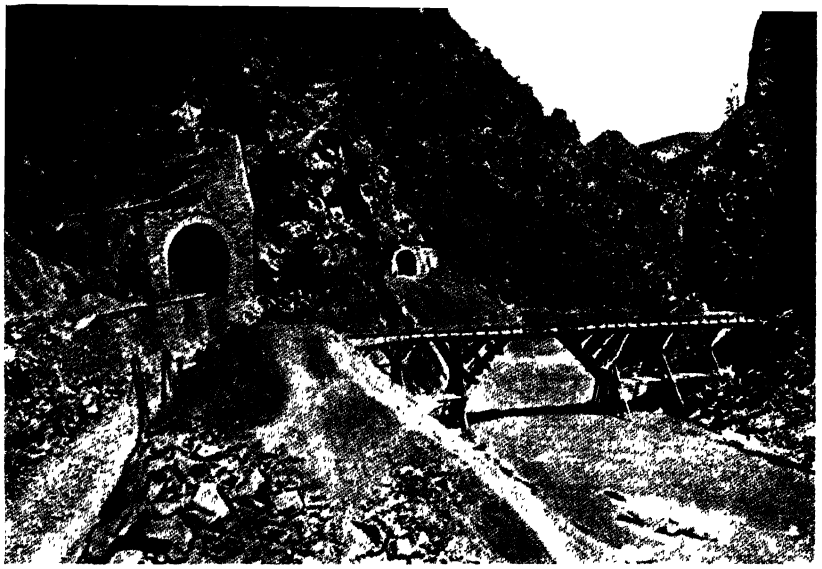
From Apsari, up the Tatli valley north of Çankiri, the steep ascent of the Batibeli heights begins, the line climbing the valley flanks with sharp curves high up the mountain-side. The highest point on the route, 4,100 feet, is reached in the middle of the Batibeli tunnel, which is 2 miles long. On emerging from it the line descends with maximum gradient and sharp curves past Göllüce station to Sumucak in the Devrez valley. This descent necessitates a viaduct, many

bridges, several small tunnels, and much earthwork. After following the Devrez and its tributary the Karacaviran, the line crosses the watershed (4,072 ft.) into the Ulu Su (the uppermost Yenice). There are no engineering difficulties in the broad open trough of this river until west of Çerkeş, where the valley narrows at the Hamamli gorge, and much engineering is required before Ismetpaşa is reached. Here the Ilgaz–Bolu–Adapazari road, which from Gerede is connected to Ankara, is crossed.

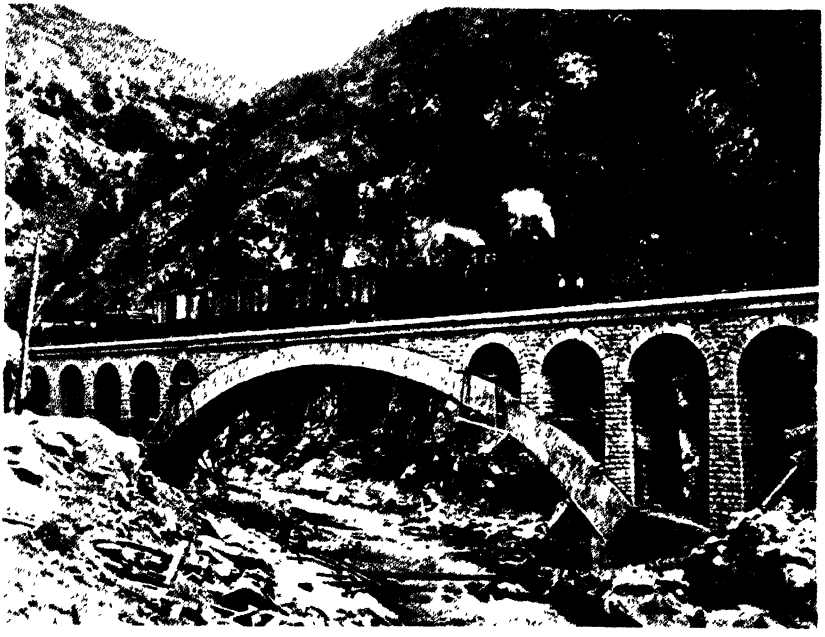
Ismetpaşa to Filyos and Zonguldak. After Ismetpaşa there is a short ascent, after which begins the steep descent to the valleys which lead to the Black Sea. The line makes a large curve, descending with a gradient of 1 in 50 through difficult hilly country to Eskipazar, which is at the bottom of the Viranşehir valley. It then follows this valley to Hanköy and Cildikisik, passing through tunnels in the Cildikisik gorge. From the important engineering centre of Karabük a road leaves for Safranbolu and the coast at Amasra. At Karabük the mountains enclosing the river are less precipitous and for a short distance the country is more cultivated. But the valley soon closes in again and forces the railway to cross and recross the river six times between Karabük and Balikisik. The first of the bridges is a magnificent four-span reinforced-concrete bridge, 173 yards long, at mile 184 (km. 295·4). After the sixth crossing near Balikisik the railway remains on the right bank almost to Filyos, but the precipitous-sided valley necessitates a large amount of tunnelling and other engineering works. In the whole of the section from Ismetpaşa to Filyos there are 30 tunnels totalling $2\frac{3}{4}$ miles. The country is broken and thickly forested, especially between Karabük and Balikisik. Beyond Balikisik the difficulties become less and the country is less wild. At Tefen the valley widens and the landscape opens out. Less than 4 miles from Filyos the railway crosses the river for the last time. Between Filyos and Zonguldak there are many difficulties to surmount, and about $4\frac{1}{2}$ miles out of the 16 are tunnelled.

The extension of the line from Zonguldak to Ereğli is now being carried out. The small section of nearly 3 miles (4·6 km.) from Zonguldak to Kozlu was nearing completion at the end of 1941. It had two tunnels (255 m. and 1,350 m.) and a reinforced concrete bridge (3×8 m.) at km. 417·8, besides many minor works.

In the detailed description of the line that follows, only the larger bridges are given, heights and distances being taken from the reports published directly on completion of the line to Filyos. It is possible that some parts of the line were damaged during the 1939 earthquake.



86. *Tunnels 143 m. and 58 m. at about km. 303, Irmak–Zonguldak railway. The timber bridge was used during the building of the line and is not permanent*



87. *Masonry bridge, main span 45 m., at km. 303·8, Irmak–Zonguldak railway*



88. *Reinforced concrete bridge, main span 45 m., at km. 305·1, near Bolkuş station, Irmak–Zonguldak railway*

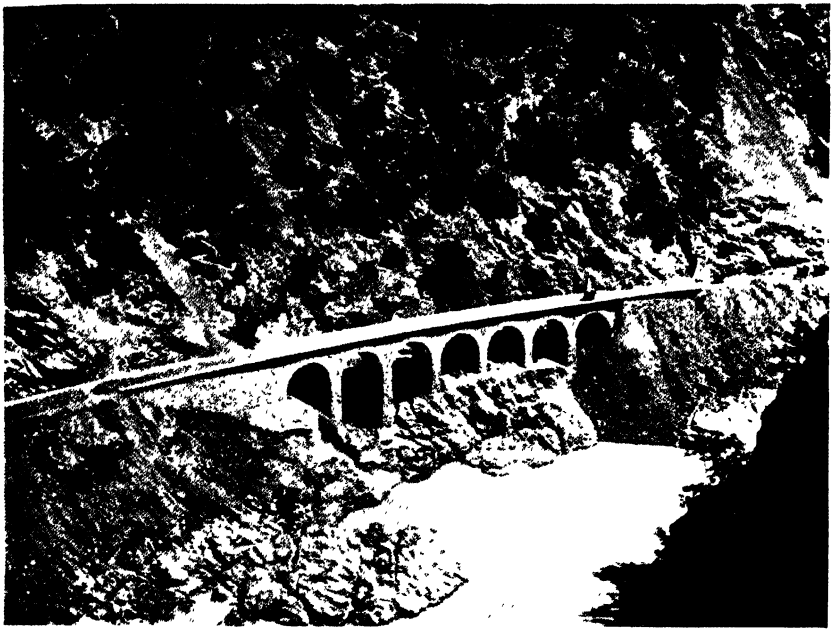


89. *View upstream Soğanli (Yenice) river. Tunnel 223 m. on right bank at km. 307, Irmak–Zonguldak railway, between Bolkuş and Balikisik*

DETAILED DESCRIPTION

Km. from Irmak	*Stations and passing-loops*	*Remarks*
0·0	IRMAK (19)	Alt. 2,227 ft. (679 m.). ES. (2 roads); Tbl.; W. (T. 44,000 gls.; Cr.); coal-stacks; Cr.; PL., small MY. (5) (2,375 m.). Junction with Route 4, Ankara–Kayseri.
3–17	..	Line follows west bank of Kizil Irmak (I, photo. 86, p. 166) crossing 6 bridges over side-streams as follows: km. 3 (2×8 m.); km. 5·9 (4×6 m.); km. 8·3 (21 m.); km. 10·2 (2×8 m.); km. 15·8 (21 m.); km. 16·9 (2×15 m.).
19·2	KALECIK (19)	Alt. 3,123 ft. (650 m.). G.; PL., LS. (757 m.). Town is 2 km. west of station and connected by motor-road.
		Line follows left bank of Kizil Irmak.
20·3	..	Steel girder bridge (3×21 m.).
22·4	..	Reinforced concrete bridge (3×15 m.) over Koramaz stream.
27–8	..	2 bridges (4×4 m.; 5×4 m.).
32·1	..	Tunnel (460 m.).
35·4	..	Bridge (2×8 m.).
38·4	ALIBEY (12)	Alt. 1,985 ft. (605 m.). W. (T. 22,000 gls.; Cr., SP.); G.; PL., LS. (847 m.).
		Line leaves Kizil Irmak to cross the watershed between it and the Tüney stream.
40·4	..	Concrete bridge, masonry piers (3×15 m.).
44·5	..	Bridge (4×4 m.).
50·7	DÜMBELEK (10)	Alt. 2,493 ft. (760 m.). PL., LS. (862 m.).
54·0	..	Watershed, alt. 2,631 ft. (802 m.).
58·9	..	Tunnel (63 m.).
60·2	TÜNEY (21)	Alt. 2,362 ft. (720 m.). G.; PL., LS. (851 m.). Station is on right bank of Tüney stream; Ankara–Kastamonu road on left bank.
62·9	..	Bridge (2×8 m.).
63·4	..	Line crosses to left bank of Tüney stream by bridge (2×10 m.+2×32 m.); total length 84 m.
64–75	..	3 bridges: km. 64·9 (3×8 m.); km. 66·5 (3×6 m.); km. 72·2 (3×6 m.).
81·0	GERMECE (21)	Alt. 2,119 ft. (646 m.). PL., LS. (862 m.).
		Line turns north-west out of Tüney valley, crosses to the Çankiri stream, and ascends its right bank.
86–100	..	4 bridges: km. 86·9 (3×6 m.); km. 90·8 (2×6 m. +8 m.); km. 97·3 (32 m., lattice girder); km. 100·0 (4×6 m.).
102·3	ÇANKIRI (15) (*Gaz.*)	Alt. 2,372 ft. (723 m.). ES. (2 roads); Tbl. (20 m.); W. (T. 13,000 gls.; Cr., SP., well); coal-stacks; G.; Wb.; SLP.; PL., 4 LS. (1,836 m.) (photo. 82).
		Line ascends the Tatli valley.
102–13	..	3 bridges: km. 102·9 (3×6 m.+8 m.); km. 107·0 (4×6 m.); km. 112·8 (3×6 m.).

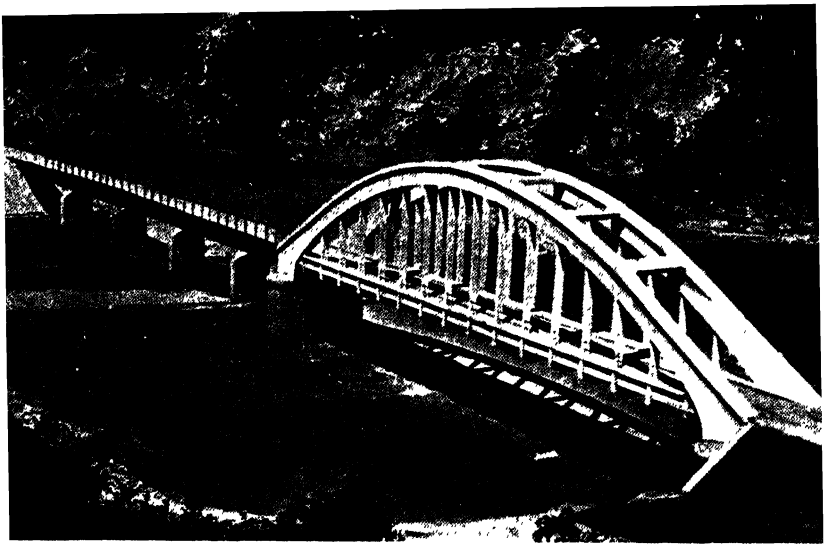
Km. from Irmak	*Stations and passing-loops*	*Remarks*
117·5	APSARI (14)	Alt. 2,749 ft. (838 m.). G.; PL., LS. (854 m.). Gradient increases to 1 in 50; minimum radius of curves, 250 m.
118·0	..	Lattice-girder bridge (32 m.).
131·1	ILDIZIM (18)	Alt. 3,455 ft. (1,053 m.). G.; PL., LS. (868 m.). Line climbs with maximum gradient (1 in 50) and minimum radius of curves to the Batibeli tunnel through the watershed between the Kizil Irmak and the Devrez river.
131·6	..	Arched masonry bridge (3×5 m.).
142·6	..	Line enters Batibeli tunnel (3,441 m.), alt. 4,100 ft. (1,250 m.), after which it begins steep descent.
146·2	..	Masonry bridge (15 m.).
147·9	..	Masonry viaduct, 6 arches (5×18 m.+8 m.); height of central arch, 36 m.
148·7	GÖLLÜCE (12)	Alt. 3,911 ft. (1,192 m.). G.; PL., LS. (867 m.). Line continues winding and steep descent, with many engineering works.
153·0	..	Tunnel (144 m.).
155·5	..	Arched masonry bridge (4×4 m.+26 m.+4×4 m.); total length 67 m.; height above ravine, 30 m.
156–8	..	2 tunnels (179 m.; 72 m.) and 2 bridges (6×4 m.; 8×4 m.).
158–9	..	Tunnel (102 m.); bridge (4×4 m.).
159·6	..	Arched masonry bridge on curve over Devrez stream (3×32 m.+3×8 m.), length 163 m. (photo. 83).
159·9	..	Tunnel (123 m.).
160·0	..	Arched masonry bridge over Karacaviran stream (2×32 m.+2×8 m.), length 94 m.
160·6	SUMUCAK (9)	Alt. 3,343 ft. (1,019 m.). W. (T. 40,000 gls.; Cr.); G.; PL., LS. (870 m.). Station is in the Devrez valley. Line now begins ascent westwards to the Ulu Su watershed.
161–5	..	2 bridges (2×8 m.; 3×7·5 m.).
169·7	KURŞUNLU (18)	Alt. 3,780 ft. (1,152 m.). G.; PL., LS. (863 m.).
173·5	..	Bridge (3×6 m.).
178·0	..	Watershed, alt. 4,072 ft. (1,241 m.).
188·4	ATKARACALAR (17)	Alt. 3,953 ft. (1,205 m.). G.; PL., LS. (862 m.). Line follows right bank of Ulu Su.
205·9	ÇERKEŞ (12) (*Gaz.*)	Alt. 3,671 ft. (1,119 m.). G.; Wb.; PL., LS. (859 m.).
212–14	..	2 bridges (both 3×8 m.).
217·8	KURTCEMENI (15)	Alt. 3,580 ft. (1,091 m.). PL., LS. (862 m.). Valley closes in to form the Hamamli gorge, with many engineering works.
220·0	..	Bridge (4×8 m.).
222·4	..	Arched masonry bridge (22 m.); length 43 m.
225·4	..	Bridge (4×8 m.).



90. *Masonry viaduct at km. 307·2, between Bolkuş and Balikisik, Irmak–Zonguldak railway*



91. *Reinforced concrete bridge over Soğanli (Yenice) river, at km. 314·4, Irmak–Zonguldak railway. View down the valley*



92. *Reinforced concrete bridge, with bowstring span of 51 m., over the Soğanli (Yenice) river at km. 318·4, Irmak–Zonguldak railway, near Balikisik station*



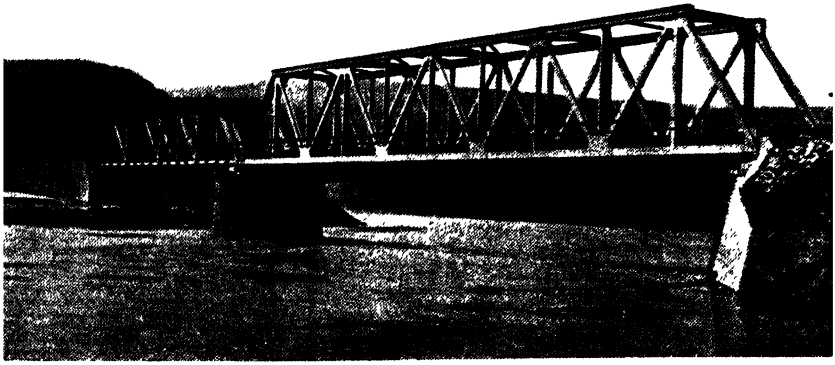
93. *Tunnel, 160 m. long, right bank of Soğanli river, 35 miles from the Black Sea, at km. 336, Irmak–Zonguldak railway*

Km. from Irmak	*Stations and passing-loops*	*Remarks*
227·1	..	Bridge (2×8 m.).
227·7	..	Arched masonry bridge (25 m.); 3 subsidiary arches; length 45 m.
228·0	..	Tunnel (214 m.).
228·6	..	Masonry viaduct (9×6 m.); length 75 m.
229–31	..	3 arched masonry bridges (each 25 m.).
232·3	ISMETPAŞA (12) (BAYINDIR)	Alt. 3,255 ft. (986 m.). ES. (2 roads); W. (T. 40,000 gls.; Cr.); G.; PL., LS. Line begins the climb over the plateau block between Ismetpaşa and Karabük.
233·5	..	Lattice-girder bridge (2×40 m.).
236·0	..	Alt. 3,347 ft. (1,020 m.). Line begins descent (1 in 50).
244·5	ORTAKÖY (10)	Alt. 2,858 ft. (871 m.). G.; PL., LS. (865 m.).
249·0	..	Bridge (4×6 m.).
250·1	..	Masonry bridge (15 m.).
254·3	ESKIPAZAR (12)	Alt. 2,303 ft. (702 m.). PL., LS. (862 m.). Descent continues along Viranşehir valley.
257–66	..	3 bridges (4×8 m.; 3×6 m.; 32 m.).
266·3	HANKÖY (9)	Alt. 1,827 ft. (557 m.). PL., LS. (849 m.).
269·3	..	Bridge (3×6 m.).
271·8	..	Stone-arched avalanche gallery.
272·2	..	Tunnel (54 m.).
275·7	CILDIKISIK (18)	Alt. 1,371 ft. (418 m.). PL., LS. (845 m.). Line tunnels through the side of the rocky Cildikisik gorge (I, photo. 43, p. 108).
277·0	..	2 tunnels (444 m.; 160 m.).
283·0	..	Bridge over Yenice river (Soğanli Su, Ulu Su). Lattice-girder central span (2×10 m.+50 m.+2×10 m.); length about 100 m. Line crosses to right bank.
289·9	..	Tunnel (174 m.).
293·0	..	Bridge (40 m.+8 m.).
293·7	KARABÜK (11) (*Gaz.*)	Alt. 853 ft. (260 m.). W. (T. 13,000 gls.; Cr., SP.); G.; PL., 2 LS. (975 m.). Road connexion with Safranbolu, Bartin, and Amasra. After widening for a short distance, the valley closes in.
295·4	..	Reinforced concrete bridge (4×32·5 m.), length 158 m. Line crosses to left bank Soğanli Su (photos. 84, 85).
298·3	..	Arched masonry bridge (3×10 m.).
300·7	..	Bridge (3×6 m.).
301·0	..	Tunnel (67 m.).
302·0	..	Bridge (2×8 m.+32 m.+8 m.).
302·9	..	Arched masonry bridge (3×30 m.), length 124 m. Line crosses to right bank Soğanli Su.
303–303·6	..	3 tunnels (58 m.; 143 m.; 51 m.) (photo. 86).
303·8	..	Arched masonry bridge. Main arch 45 m.; 7 subsidiary arches on Irmak side, 4 on Filyos side,

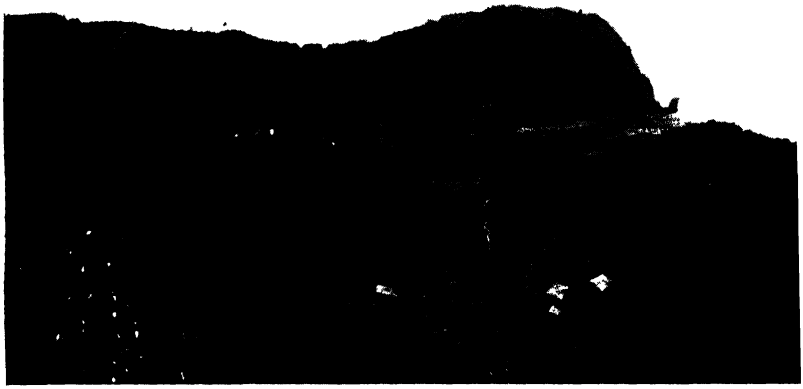
Km. from Irmak	*Stations and passing-loops*	*Remarks*
		spans from 4 m. to 4·75 m.; total length 91·2 m. (photo. 87). Line crosses to left bank Soğanli Su.
303·9	..	Tunnel (151 m.).
304·6	Bolkuş (15)	Alt. 705 ft. (215 m.). PL., LS. (862 m.). Soğanli valley is now very restricted, and the whole route is heavily engineered.
305·1	..	Reinforced concrete bridge over Soğanli Su. Main arch 45 m.; 2 spans (10 m.) on Irmak side, one on Filyos side; length 82 m. (photo. 88). Line crosses to right bank.
306–7	..	2 tunnels (476 m.; 223 m.) (photo. 89).
307·2	..	Arched masonry viaduct (7 × 6 m.) (photo. 90).
307·9–314·2	..	10 tunnels (206 m.; 120 m.; 172 m.; 101 m.; 191 m.; 34 m.; 168 m.; 42 m.; 20 m.; 143 m.); total length 1,197 m.
314·4	..	Reinforced concrete bridge (3 × 27·5 m.); length 103 m. (photo. 91). Line crosses to left bank Soğanli Su.
317·8	..	2 tunnels (110 m.; 247 m.).
318·4	..	Reinforced concrete bridge; 5 subsidiary straight spans and 1 main bowstring span (12 m. + 3 × 15 m. + 13 m. + 51 m.); length 126 m. (photo. 92). Line crosses to right bank Soğanli Su.
319·4	Balikisik (10)	Alt. 486 ft. (148 m.). PL., LS. (862 m.).
322·7	..	Bridge (2 × 8 m.).
323·3	..	2 tunnels (124 m.; 72 m.).
329·5	Cebeciler (10)	Alt. 387 ft. (118 m.). W. (T. 13,000 gls.; Cr., SP.); PL., LS. (862 m.). River-side is protected by defence works; hills are densely forested.
336·0	..	Tunnel (160 m.) (photo. 93).
339·8	Kayadibi (14)	Alt. 299 ft. (91 m.). PL. (513 m.).
342·1	..	Tunnel (89 m.).
346·1	..	Tunnel (landslide gallery, 46 m.).
350·5	..	Tunnel (230 m.). Country begins to open out and is cultivated.
352·0	..	Bridge (3 × 6 m.).
353·5	Tefen (16)	Alt. 199 ft. (58 m.). G.; PL., LS. (892 m.).
369·3	Çaycuma (21)	Alt. 78 ft. (24 m.). W. (T., Cr.); G.; PL., LS. (862 m.) (photo. 94).
381·1	..	Bridge (21 m.), over Kokak stream.
383·9	..	Lattice-girder bridge (50 m. + 32 m.) over Filyos river (Soğanli Su) (photo. 95). Line crosses to left bank.
388·3	..	Tunnel (148 m.).
390·3	Filyos (15) (*Port*)	Alt. 23 ft. (7 m.). ES. (2 roads); Tbl. (20 m.); W. (T. 26,000 gls.; Cr., SP., well); RpS. (light); G.; PL., LS., 2 DES. (1,172 m.). 7 tunnels (details not known) and 1 bridge (3 × 8 m.) (photo. 97).
405·3	Çatalağzi (4)	Alt. 33 ft. (10 m.). W. (T., Cr.); G.; Wb.; PL., numerous Sdgs.



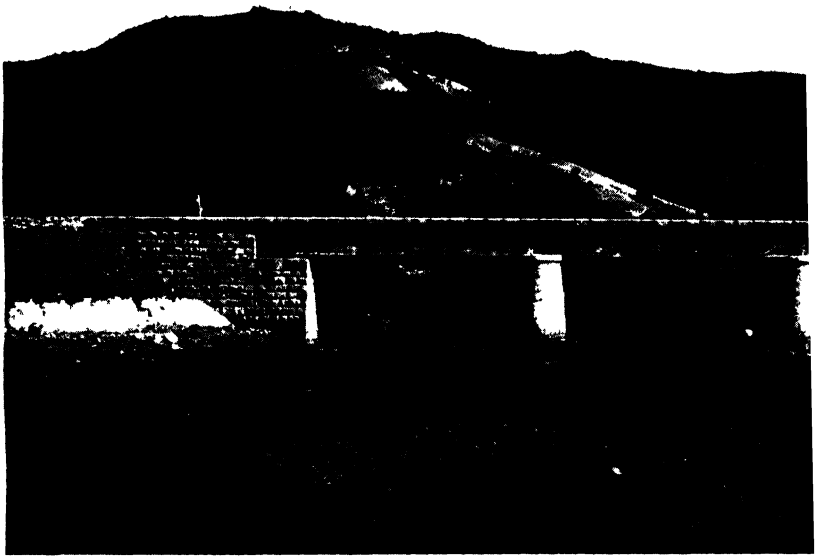
94. *Ten miles from the Black Sea Coast. View towards Filyos at about km. 373, Irmak–Zonguldak railway*



95. *Girder bridge, spans 50 m. and 32 m., 4 miles from Filyos, at km. 383·9, Irmak–Zonguldak railway*



96. *Railway and tunnel under construction at Kilimli*



97. *Bridge at Çatalağzi, Irmak–Zonguldak railway*

Km. from Irmak	*Stations and passing-loops*	*Remarks*
		2 tunnels (details not known).
408·8	KILIMLI (7)	Alt. 36 ft. (11 m.). Wb.; PL., 3 DES.
		6 tunnels (one of 1,508 m., details of others not known) (photo. 96).
		Bridge over Üzülmez river (2×40 m.+11 m.).
415·3	ZONGULDAK (*Port*)	Alt. 33 ft. (10 m.). W. (T., Cr.); G.; Wb., MY. (8 roads).

12. SIVAS (KALIN)–SAMSUN

(*Completed 1932; see page 254*)

Route

Sivas–Kalin	15·2 miles	24·4 kilometres
Kalin–Amasya	152·1 ,,	244·8 ,,
Amasya–Samsun	82·5 ,,	132·8 ,,
	249·8	402·0

Branch lines

From Samsun a narrow-gauge (0·75 m.) line leaves for Çarşamba (Route 12 *a*). A summary is given at the end of the General Description of the main line.

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, steel. Maximum axle-load, 20 metric tons. Minimum radius of curves: 200 m. between Lâdik and Samsun; otherwise 250 m. Maximum gradient, 1 in 40. Maximum distance between stations, 22 km. between Havza and Lâdik.

Speed and capacity

Overall time (including stops): passenger trains 13 hours; goods trains 17 hours. Capacity of line: 10 trains each way in 24 hours.

Miscellaneous

Marshalling yards at Sivas, Turhal, Havza, Samsun; engine-sheds at Sivas, Zile, Samsun. Main repair shops at Sivas; light repairs at the engine-sheds.

GENERAL DESCRIPTION

This line is, like the last, an important link between the plateau and the Black Sea coast. It leaves the Kayseri–Sivas line at Kalin,

15 miles west of Sivas, and immediately crosses the Kizil Irmak, to join the Sivas–Yozgat road near Menteşe (Menace), whence road and railway take the same route to beyond Yildizeli. Here the line turns north and crosses bare mountain country, though there are fertile cultivated districts between the mountains.

Difficult country is met with after Subaşi. The line passes through a succession of tunnels in the Çamlibel Dağlari (alt. *c.* 5,400 ft.) and then follows the defile of the Karadere Cinözü to Musaköy, not far from Sulusaray. Here it meets the Çekerek valley, makes a sharp bend, and goes eastwards up it, crossing the river at about mile 70 (km. 114) to its right bank. It then turns up a side valley to Kunduz, and passes through the forest-covered Deveci mountains.

Beyond Silis the country begins to open out, and at Boztepe the railway reaches a rich and well-cultivated district which extends to beyond Zile. At Turhal it reaches the valley of the Yeşil Irmak, and from here to Kayabaşi the country is again difficult, the Yeşil Irmak cutting a deep passage through the Evkere Dağı; there are many tunnels in this section of the line. At Kayabaşi the country again opens out and is well cultivated, and there are large fields of poppies before Amasya is reached. The district is one where much fruit is grown, and there are fine orchards of apple- and pear-trees.

At Amasya (alt. 1,283 ft.) the line leaves the Yeşil Irmak, which goes off north-eastwards through a gorge to the trough of the Kelkit. The railway is enclosed as far as Boğazköy, where it reaches the broad irrigated plain of Suluova. A road branches off near Boğazköy to Merzifon and another climbs the Ak Dağ northwards to Lâdik. The line ascends the Tersakan Çayi, past Alevi (or Suluova) station; between Hacibayram and Havza, where it enters a narrow valley again, there are some irrigation headworks across the Tersakan, and two canals will take water from the river to irrigate the Suluova plain. The line winds up to the watershed of the Sirali Dağı near Lâdik station, and descends to Kavak. From Lâdik station there is a road southwards to Lâdik and Lâdik Gölü, where a regulator was projected in 1938 (p. 153). At Kavak the road from Amasya to Samsun, which has followed the railway to this place, takes a different route over the hills, the line keeping to the valley of the Murat stream, which reaches the sea a short distance east of Samsun.

Construction details of this railway are not available. It was begun from the Samsun end, material being landed at that port. There are said to be 37 tunnels—one report says 43—totalling 4,914 metres (about 3 miles), and about 20 of these occur between Lâdik and

Samsun. In the following list of stations and their facilities only a very rough estimate is given of some of the major works. The line is in the region which suffered very severely in the earthquake of 1939.

12 *a. Samsun to Çarşamba*

A narrow-gauge single-track line (gauge 0·75 m.), 24 miles (39 km.) long, from Samsun to Çarşamba was completed in 1934. It follows the coast for about 5 miles and then keeps inland to avoid the marshlands of the Yeşil Irmak delta. There must be several bridges on this line, for it crosses a number of small streams, but details are not known. It passes the following stations: Samsun, Kirazlik (25 min. run), Tekeköy (38 min.), Hamzali (55 min.), Dikbiyik (72 min.). Çarşamba is reached in 93 minutes from Samsun. The service (1940) is 5 trains a day each way.

DETAILED DESCRIPTION

Km. from Sivas	*Stations and passing-loops*	*Remarks*
0·0	SIVAS (9) (*Gaz.*)	Alt. 4,150 ft. (1,265 m.). ES.; Tbl. ; W. (T. 30,000 gls.; 2 Cr.); main RpS.; G.; PL. and numerous Sdgs. (2,419 m.).
9·2	SÖĞÜTLÜHAN (15)	Or Söğütlühamam. Alt. 4,124 ft. (1,257 m.). PL. (517 m.).
24·4	KALIN (14)	Alt. 4,127 ft. (1,258 m.). W. (T. 18,000 gls.; Cr.); G.; PL.; 2 LS. (1,251 m.). Junction with main line (Route 5). Kalin village is north of the Kizil Irmak. Line crosses Kizil Irmak, and follows the Kalin tributary.
38·0	MENTEŞE (16)	Or Menace. Alt. 4,337 ft. (1,322 m.). G.; PL., LS. (848 m.).
54·2	YILDIZELI (19)	Or Yenihan. Alt. 4,452 ft. (1,357 m.). W. (T. 13,000 gls.; Cr.); G.; PL., LS. (872 m.).
73·1	SUBAŞI (12)	Alt. 4,852 ft. (1,479 m.). PL., LS. (865 m.); turning triangle.
c. 77	..	Watershed of Çamlibel Dağlari, alt. 4,954 ft. (1,510 m.). Line descends, crossing 2 bridges, and passing through tunnel.
84·7	ÇAMLIBEL (11)	Alt. 4,515 ft. (1,376 m.). W. (T. 18,000 gls.; Cr.); PL., LS. (918 m.). Line continues descent, gradient 1 in 50, passing through more tunnels.
95·7	TOPULYURDU (14)	Or Topuzyurdu. Alt. 3,993 ft. (1,217 m.). PL., LS. (842 m.). Descent eases towards Musaköy.

Km. from Sivas	*Stations and passing-loops*	*Remarks*
109·3	MUSAKÖY (16)	Or Mucaköy, Sulusaray. Alt. 3,491 ft. (1,064 m.). G.; PL., LS. (604 m.); turning triangle. Line ascends the Çekerek valley eastwards and crosses the river to the right bank.
125·7	KUNDUZ (17)	Alt. 3,835 ft. (1,169 m.). G.; PL. (424 m.). Line traverses the Deveci Dağ.
142·6	ULUSULU (16)	Alt. 3,642 ft. (1,110 m.). W. (T. 18,000 gls.; Cr.); G.; PL. (409 m.).
158·8	SILIS (15)	Alt. 3,110 ft. (948 m.). G.; PL. (433 m.). Country begins to open out.
173·6	BOZTEPE (14)	Alt. 2,526 ft. (770 m.). PL. only. Line passes through cultivated countryside.
187·2	ZILE (18) (*Gaz.*)	Alt. 2,152 ft. (656 m.). ES.; Tbl.; W. (T., Cr.); G.; SLP.; ELP.; PL., 2 LS., several DES. (1,225 m.); turning triangle.
205·6	TURHAL (15)	Alt. 1,749 ft. (533 m.). G.; SLP.; ELP.; MY. (3), PL., LS., DES. (2,113 m.). Line now follows valley of Yeşil Irmak through the defile of the Evkere Dağı.
c. 213	..	2 tunnels.
221·0	SAMURÇAY (16)	Alt. 1,670 ft. (509 m.). G.; ELP.; PL. (343 m.). 6 tunnels near Samurçay; bridge over Yeşil Irmak about km. 236.
236·9	KIZOĞLU (20)	Alt. 1,549 ft. (472 m.). G.; ELP.; PL. (338 m.). Bridge over Yeşil Irmak, about km. 248.
256·4	KAYABAŞI (13)	Alt. 1,335 ft. (407 m.). G.; ELP.; PL., LS. (678 m.). Line passes through 2 tunnels about kms. 259 and 262. Countryside then opens out as Amasya is approached.
269·2	AMASYA (13) (*Gaz.*)	Alt. 1,283 ft. (391 m.). Tbl.; W. (T. 40,000 gls.; Cr.); SLP.; ELP.; PL., 2 LS., DES. (1,634 m.).
c. 277	..	Viaduct over Tersakan river (6 m. + 3 × 10 m. + 6 m. + *c.* 70 m.).
282·3	BOĞAZKÖY (20)	Alt. 1,759 ft. (536 m.). ELP.; PL., LS. (544 m.). 2 tunnels about km. 292.
296·4	..	Halt only.
302·0	HACIBAYRAM (14)	Alt. 1,785 ft. (544 m.). G.; SLP.; ELP.; PL., LS.
304·0	*Çeltikmadeni*	SLP.; 2 DES. (773 m. and 117 m.). Mines. 2 tunnels about km. 305–6.
316·3	HAVZA (22) (*Gaz.*)	Alt. 2,028 ft. (618 m.). W. (T. 13,000 gls.; Cr.); G.; Cr.; SLP.; ELP.; PL., MY. (3) (1,036 m.). Line climbs steeply towards the watershed of the Sirali Dağı, gradient *c.* 1 in 45.
c. 335	..	2 tunnels (one about 550 m.).
337·8	LÂDIK (17) (*Gaz.*)	Alt. 2,802 ft. (854 m.). W. (T. 11,000 gls.; Cr.); G.; ELP.; PL., LS. (644 m.). Line begins descent of Kavak pass at gradient of 1 in 41.
354·7	KAVAK (14)	Alt. 1,798 ft. (548 m.). W. (T. 14,000 gls.; Cr.); G.; SLP.; PL., LS., short DES. (1,292 m.).
368·2	ÇUKURBÜK (15)	Alt. 1,457 ft. (444 m.). PL. (365 m.).

Km. from Sivas	*Stations and passing-loops*	*Remarks*
		Line descends with maximum gradient of 1 in 40 through the Murat valley with numerous works, including 3 large bridges and many tunnels.
383·6	KURCALAN (9)	Alt. 528 ft. (161 m.). W. (T. 18,000 gls.; Cr.); PL. (254 m.). Bridge and 3 tunnels.
392·1	DEMIRCIKÖY (10)	Alt. 190 ft. (58 m.). ELP.; SLP.; PL., DES. Murat valley opens out.
402·0	SAMSUN (*Port*)	Alt. 7 ft. (2 m.). ES. (2 roads); Tbl.; W. (T. 14,000 gls.; Cr.); G.; Cr.; Wb.; SLP.; MY. (4) and several Sdgs. (2,725 m.). Junction for narrow-gauge line (0·75 m.) to Çarşamba (*above*, p. 313). Normal-gauge line continues past goods station (S. Merkez) with G., PL., DES., to terminus at the Customs quay (Gümrük, km. 404·0), with LS., DES. (586 m.).

13. MUDANYA–BURSA

(*Completed 1894; see page 244*)

Distance: 25·5 miles, 41·1 kilometres.

Permanent way

Gauge, narrow (3 ft. 5⅜ in.; 1·05 m.). Single track throughout. Sleepers, wooden. Maximum axle-load, 15 metric tons. Maximum gradient: 1 in 40 landwards; 1 in 66 seawards.

Speed and capacity

Overall time (including stops), 1½ hours for mixed trains. Capacity of line: 5 trains in 24 hours (time-table); 8 trains possible with more rolling-stock.

Miscellaneous

Trains can pass at Koru; there may be passing-loops at some other stations. Engine-sheds at Mudanya and Bursa; no details of marshalling yards or repair shops.

GENERAL DESCRIPTION

This line, serving the rich agricultural plain of Bursa, where vines, olives, mulberries, and cereals are extensively grown, has some strategic importance. It has been surveyed for conversion to normal standard gauge and for extension to join the Haydarpaşa–Eskişehir line (Route 2) at Bozüyük (km. 263·3). When completed this line will form an important line from the Marmara coast to the central plateau.

At present (1940) trains comprise two passenger coaches and goods wagons as required. The line climbs steeply over the coast range and descends to the Nilüfer river and the plain of Bursa, from which it rises to the town of Bursa on the lower slopes of the Ulu Dağ. It takes a winding course in order to avoid engineering works.

DETAILED DESCRIPTION

Km. from Mudanya	*Stations*	*Remarks*
0·0	MUDANYA (23) *(Port)*	ES.; Tbl. (12 m.); W. (T. 5,000 gls.; Cr.; HP.); Sdgs. Station is 300 m. from landing-stage. Line rises in two great curves through woods to watershed of coast range, gradient 1 in 40.
10·4	YÜRÜKALI	Alt. 712 ft. (217 m.). Line winds down to Nilüfer valley; gradient 1 in 66; banking between km. 21 and 24.
21·9	..	Steel bridge over Nilüfer river, 6 spans, total length 67·4 m. River-banks wooded with tamarisk and plane-trees; hills dotted with small oaks, almond, and wild pear.
22·5	KORU (19)	W. (T.); PL. Line rises 1 in 50.
c. 32	BEŞEVLER	Halt, rarely used. Village is on Karacabey–Bursa road. Cultivated countryside.
34·9	..	Steel bridge over Nilüfer river, 7 spans, total length 82·7 m.
36·0	ÇEKIRGE	Formerly Acemler. Halt for hot baths.
38·8	MURADIYE	Formerly 'Bursa Halt'.
41·1	BURSA *(Gaz.)*	Alt. 394 ft. ES.; Tbl. (12 m.); W. (T. 5,000 gls.; Cr., SP., well). Station is 1 mile north-east of town.

14. IZMIR–MANISA–AFYONKARAHISAR

(Completed c. 1900; see page 243)

Route

Izmir–Manisa	41·0 miles	66·0 kilometres
Manisa–Alaşehir	64·0 ,,	103·0 ,,
Alaşehir–Uşak	73·2 ,,	117·8 ,,
Uşak–Afyonkarahisar	83·8 ,,	134·9 ,,
	262·0	421·7

Junction

Manisa is the junction for the line to Balikesir and Bandirma (Route 15).

Permanent way and stations

Gauge, normal (1,435 mm.). Single track, Mersinli–Afyonkarahisar; double track, to Mersinli. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers,

wooden. Maximum axle-load, 13·5 metric tons. Minimum radius of curves, 300 metres. Maximum gradient: eastwards, 1 in 40; westwards, 1 in 59. Maximum distance between stations, 24 km.

Speed and capacity

Overall time (including stops):

Izmir–Manisa: passenger trains 1¾ hours; goods 3 hours.

Manisa–Alaşehir: passenger trains 3 hours; goods 5 hours.

Alaşehir–Uşak: passenger trains 4 hours; goods 5 hours.

Uşak–Afyonkarahisar: passenger trains 3½ hours; goods 5 hours.

Capacity of line: Izmir–Alaşehir: 16 trains each way in 24 hours; Alaşehir–Afyonkarahisar, 12 trains each way.

Miscellaneous

Marshalling yards at Izmir, Manisa, Alaşehir, Afyonkarahisar junction. Engine-sheds at the same places and at Halkapinar, Turgutlu, Salihli, Inay, Uşak, Banaz, Afyonkarahisar town. Locomotive repair shops at Halkapinar (main shops for Routes 14, 15, 16). Heavy repairs also at Afyonkarahisar junction.

GENERAL DESCRIPTION

This important line, built and operated by a French company in Ottoman days (p. 243), makes use of the broad trough of the Gediz (*class.* Hermus) and so passes through the homeland of the ancient kingdom of Lydia. From Alaşehir (*class.* Philadelphia) it crosses the trough and climbs northwards to the plateau block at Uşak, and from the head of the Banaz plain crosses the watershed to the headstreams of the Porsuk, and then the valley of the Dalay to Afyonkarahisar.

Izmir–Manisa. The line skirts the head of the Gulf of Izmir, keeping close to the shore, and then turns north along the foot of the Yamanlar Dağ, to reach the Gediz at Menemen, mile 19½ (km. 31·6); here it turns east up the valley. There are many small bridges and culverts with spans up to 30 feet, rendered necessary by the marshy country and by the small streams which have to be crossed.

Manisa–Alaşehir. From Manisa, the junction of the line to Balikesir and Bandirma (Route 15), the line continues up the broad marshy Gediz valley, keeping along the southern edge and crossing a large number of small bridges over side valleys and ravines. It passes through Turgutlu, the former Kassaba, which gave its name to the early railway (Smyrne–Cassaba et Prolongement), and Sart, a small unimportant station, which lies about a mile north of the ruins of

Sardis, the ancient Lydian capital (I, photo. 120, p. 269). The necropolis, a group of mounds now known as Bintepeler ('thousand mounds'), is on the plain north of the Gediz. Beyond Salihli the line passes up the Koca (or Sarkis) valley, the same structural feature as that of the Gediz lower down (I, p. 137), to Alaşehir.

Alaşehir–Uşak. From Alaşehir the line crosses the Koca valley and begins the steep difficult climb to the plateau. In this section there are a large number of engineering works. Between Konakler, mile 116 (km. 187), and Günayköy, mile 128 (km. 207), there are numerous cuttings, 19 tunnels totalling 2·3 miles, and 3 viaducts, the line climbing 1,560 feet in these 12 miles. Uşak is almost at 3,000 feet and is an important route-centre.

Uşak–Afyonkarahisar. From Uşak the line climbs over a broad plateau spur past Kapakler to the Banaz plain, and thus enters the northernmost tributary valley of the Büyük Menderes, which it follows to the Aegean–Black Sea watershed between the wooded Murat Dağ and Ahir Dağ. It crosses at mile 220 (km. 355) at 4,104 feet. This region was fiercely contested by the Greeks and Turks during the War of Independence, and it was between Dumlupinar and the 'little village' of Küçükköy (now Yilderimkemal) that the Turks fought the last decisive action against the Greeks in 1922, which opened the road to Izmir (I, p. 321). Beyond here the line descends the head-valley of the Porsuk, traverses some bare hills to the Dalay valley, and finally crosses the open plain north-west of Afyonkarahisar. The town station, originally the terminus, is about a mile distant from the junction on the Eskişehir–Konya line (Route 8), but the two stations are connected.

DETAILED DESCRIPTION

Km. from Izmir	*Stations and passing-loops*	*Remarks*
0·0	IZMIR (3) (Basmahane) (*Port*)	Alt. 23 ft. (7 m.). W. (T. 18,000 gls.; 3 Cr., SP.); G.; SLP.; MY., Sdgs. (4,108 m.). For site of station *see* fig. 16. Access to harbour is by Hilal junction and by Route 17.
1·1	HILÂLKEMER	Alt. 26 ft. (8 m.). G. Junction, and triangular connexion with Route 17.
2·5	..	Steel girder bridge (7·6 m.).
2·6	HALKAPINAR (5)	Alt. 7 ft. (2 m.). ES.; 2 Tbl. (one of 20 m.); RpS.; coal-stack; W. (T. 18,000 gls.; Cr., SP.); G.; Cr.; Wb.; PL., MY. (8), numerous Sdgs., DES. (3,395 m.).
3·4	*Mersinli*	Halt. Double line ends here, one line leaving

Km. from Izmir	*Stations and passing-loops*	*Remarks*
		for Burnuva (formerly Burnabat), 6·8 km. from Izmir, alt. 105 ft. (32 m.).
4·8	*Salhane*	Halt at head of Gulf of Izmir. Line keeps close to shore.
5·6	..	Steel girder bridge (2 × 9·1 m.).
6·2	*Bayrakli*	Halt.
7·9	TURAN (3)	Alt. 7 ft. (2 m.). PL. (401 m.).
10·7	*Alaybey*	Halt.
11·1	KARŞIYAKA (2)	Alt. 13 ft. (4 m.). W. (T. 650 gls.; Cr.); SLP.; PL., LS., 3 short DES. (775 m.).
12·0	*Bostanliköy*	Halt.
13·5	HACIHÜSEYINLER (4)	Alt. 16 ft. (5 m.). SLP.; PL., LS. (270 m.). The line makes a wide bend round the foothills of the Yamanlar Dağ and enters the alluvial borders of the Gediz delta. Bostanliköy and Hacihüseyinler used to be known as Papa Scala and Thomaso.
17·1	ÇIĞLI (7)	Alt. 23 ft. (7 m.). SLP.; PL., 2 LS. (607 m.). Line crosses 2 steel girder bridges (each 2 × 9·1 m.).
24·4	ULUCAK (7)	Alt. 23 ft. (7 m.). PL., LS., short DES. (221 m.).
30·3	..	Steel bridge, skew (5 × 8·3 m.).
31·6	MENEMEN (7) (*Gaz.*)	Alt. 66 ft. (20 m.). W. (T. 9,000 gls.; Cr.; SP.; well); G.; Wb.; SLP.; PL., 2 LS., short DES. (979 m.). Line approaches Gediz river and keeps to left bank between wooded hills.
39·0	EMIRÂLEM (17)	Alt. 75 ft. (23 m.). PL., short DES. (501 m.). Valley closes in; line keeps close to Gediz river bank, crossing 8 steel girder bridges over side streams, all with 1, 2, or 3 spans of 9·1 m.
56·0	MURADIYE (7)	Alt. 112 ft. (34 m.). G.; SLP.; PL., LS. (410 m.). Line keeps to the south of the irrigated Manisa plain, crossing 4 steel bridges.
63·1	HOROZKÖY (3)	Alt. 157 ft. (48 m.). SLP.; PL. (182 m.). 2 similar steel bridges.
66·0	MANISA (14) (*Gaz.*)	Alt. 164 ft. (50 m.). Three platform tracks; ES.; Tbl.; W. (T. 18,000 gls.; Cr., SP., well); G.; Wb.; 2 SLP.; ELP.; PL., MY. (4), 4 short DES. (1,811 m.). Junction with line to Bandirma (Route 15). 5 similar steel bridges, all over ravines from the Manisa Dağ.
79·6	ÇOBANISA (13)	Alt. 135 ft. (41 m.). G.; SLP.; PL., short LS. (410 m.). Line crosses 7 steel bridges as it passes the entrance to the Nif valley; the first two are large, across its main streams; the others are small single-span steel girder bridges.
83·1	..	Steel girder bridge (3 × 16·2 m.) over Nif Çay.
89·9	..	Steel girder bridge (3 × 9·1 m.).

Km. from Izmir	*Stations and passing-loops*	*Remarks*
93·1	TURGUTLU (13) (*Gaz.*)	Formerly Cassaba. Alt. 223 ft. (68 m.). ES.; Tbl.; W. (T. 9,000 gls.; Cr., SP., well); G.; Wb.; SLP.; PL., 2 LS. (913 m.).
		8 small steel bridges, 5 being little more than culverts.
106·0	URGANLI (8)	Alt. 233 ft. (71 m.). G.; SLP.; PL. (395 m.).
		2 small steel bridges.
113·7	AHMETLI (10)	Alt. 282 ft. (86 m.). G.; Wb.; SLP.; PL., short LS. (393 m.).
		Gediz valley widens opposite Ahmetli and north of it the Marmara lake lies in an embayment of the hills. Immediately across the river are the tumuli of Bintepeler ('1,000 mounds'). The Çal Dağ hills south of the line are rugged and broken.
		Line crosses the Gencer stream immediately outside Ahmetli (steel girder bridge, 2×9·1 m.), and the Sart stream just before Sart (2×6·1 m.).
123·5	SART (8)	Alt. 335 ft. (102 m.). G.; SLP.; PL. (395 m.). Station is 2 km. north of the site of ancient Sardis.
		6 small steel girder bridges (longest 2×9·1 m.).
131·6	SALIHLI (11) (*Gaz.*)	Alt. 358 ft. (109 m.). ES. (disused); 3 Tbl.; W. (T. 12,000 gls.; Cr., SP., well); G.; Wb.; SLP.; PL., 3LS. (811 m.).
		Line turns up the broad Koca valley.
		9 small bridges (longest 2×6·3 m.).
142·9	YEŞILKAVAK (10)	Alt. 430 ft. (131 m.). G.; SLP.; PL. (392 m.). The station used to be known as Monavak. To the north-east is the region of extinct volcanoes, lava, and hot springs (*class.* Catacecaumene, 'Burnt Land').
		3 small bridges (longest 3×6 m.).
153·1	DEREKÖY (7)	Alt. 476 ft. (145 m.). G.; SLP.; PL., LS. (537 m.).
159·9	..	Steel girder bridge (2×4·6 m.+2×6·1 m.).
160·3	ALKAN (9)	Alt. 525 ft. (160 m.). G.; SLP.; PL. (414 m.).
		3 bridges (longest 3×6·1 m.).
169·0	ALAŞEHIR (9) (*Gaz.*)	Alt. 620 ft. (189 m.). 2 ES.; Tbl.; W. (T. 18,000 gls.; Cr., gravity-feed); G.; Wb.; 2 SLP.; PL., MY. (4), short DES. (1,831 m.).
		Line crosses the plain to Kinlik, generally on a low embankment, well drained by bridges and culverts. The Koca channels are crossed by 4 larger bridges between km. 176 and 177 (3×15 m.; 15 m.; 2×15 m.; 15 m.).
178	KINLIK (9)	Alt. 522 ft. (159 m.). G.; SLP.; PL., LS. (727 m.).
		The railway now begins to rise, steadily at first, as before on a low embankment with numerous small culverts and 1 steel bridge, of span 9·6 m.,

Km. from Izmir	*Stations and passing-loops*	*Remarks*
		over the Karakuyu Dere (km. 179·6). Here the line enters the mountain region, with alternate cuttings and embankments of no great length, but with the incline steepening to 1 in 40.
185·6	..	Tunnel No. 1 (119 m.).
187·4	KONAKLER (11)	Alt. 1,129 ft. (344 m.). W. (T. 9,000 gls.; Cr.; gravity-feed); PL. (287 m.).
		The maximum gradient (1 in 40) is almost continuous from here to Günayköy, with a constant succession of cuttings, tunnels, and embankments, numerous small culverts, and 3 large viaducts. The most important works only are given here.
189·1	..	Viaduct No. 1 (30 m.+100 m.+30 m.), length 186 m.; lattice-girders below rail-level.
189·4	..	Tunnel No. 2 (103 m.).
189·7	..	„ 3 (86 m.).
190·3	..	„ 4 (128 m.).
192·0	..	„ 5 (267 m.).
192·4	..	„ 6 (163 m.).
193·1	..	„ 7 (351 m.).
193·6	..	„ 8 (134 m.).
194·2	..	„ 9 (156 m.).
195·2	..	„ 10 (235 m.).
196·3	..	„ 11 (126 m.).
197·2	..	„ 12 (78 m.).
198·1	PL. (9)	W. (T. 3,500 gls.; Cr.); PL.
198·9	..	Tunnel No. 13 (260 m.).
199·3	..	Viaduct No. 2 (6×30 m.), length 195 m.; height of track above bottom of ravine 103 m.; lattice-girders below rail-level.
202·2	..	Tunnel No. 14 (265 m.).
203·2	..	„ 15 (315 m.).
204·4	..	„ 16 (530 m.).
205·1	..	Viaduct No. 3 (3×30 m.), length 110 m.; height of track above bottom of ravine 27 m., lattice-girders below rail-level.
205·3	..	Tunnel No. 17 (152 m.).
205·8	..	„ 18 (95 m.).
206·1	..	„ 19 (65 m.).
207·0	..	„ 20 (243 m.).
207·5	GÜNAYKÖY (10)	Alt. 2,690 ft. (820 m.). W. (T. 18,000 gls.; Cr., gravity-feed); G.; SLP.; PL., LS. (557 m.).
		Line now crosses open plateau, furrowed by many shallow watercourses, which require numerous small culverts for drainage, but no bridges. There are no steep inclines.
217·9	EŞME (17)	Alt. 2,700 ft. (823 m.). G.; Wb.; SLP.; PL., LS. (667 m.).
223·1	..	Steel girder bridge (2×13 m.) over Takmak stream.

Km. from Izmir	*Stations and passing-loops*	*Remarks*
		Line rises with gradient of 1 in 66 to km. 229, afterwards descending 1 in 59 to Ahmetler. There are only culverts of minor importance in this section.
235·0	AHMETLER (6)	Alt. 2,356 ft. (718 m.). PL. (303 m.) only.
241·2	PL. (11)	W. (T. 18,000 gls.; Cr., gravity-feed); PL.
		Line descends through hilly country, with maximum gradients of 1 in 40. There are numerous culverts over ravines, but only 2 fair-sized bridges as below:
241·5	..	Steel girder bridge (2 × 13 m.).
247·6	..	Steel girder bridge (2 × 6 m.).
252·2	INAY (20)	Alt. 2,477 ft. (755 m.). G.; Wb.; SLP.; PL., LS., Short DES. (726 m.).
		Maximum upward and downward gradients 1 in 59 as far as Narlik. Numerous culverts.
271·8	NARLIK (15)	Formerly Karakuyu. Alt. 2,995 ft. (913 m.). G.; Wb.; SLP.; PL. (400 m.).
		Line crosses open fairly level plateau to Uşak with many culverts.
278·1	..	Steel girder bridge (3 × 6 m.).
286·8	UŞAK (5) (*Gaz.*)	Alt. 2,979 ft. (908 m.). ES. (2 roads); Tbl.; W. (T. 26,000 gls.; Cr., SP., well); G.; Wb.; 2 SLP.; PL., LS., several DES. (1,719 m.). Important 2nd-class station and road junction.
288·5	..	Steel girder bridge (15 m.).
		Line climbs steadily over a southern spur of the Murat Dağ; numerous culverts.
292·1	ŞEKER FABRIKASI (11)	PL., 2 LS., many DES. at large sugar-beet factory.
297·8	..	Steel girder bridge (13 m.).
303·1	KAPAKLER (14)	Alt. 3,202 ft. (976 m.). G.; SLP.; PL. (402 m.).
317·0	PL. (10)	PL. only.
		Line descends to Banaz plain (*Ovasi*), crossing numerous culverts.
327·2	BANAZ (18)	Alt. 2,999 ft. (914 m.). G.; Wb.; SLP.; PL., LS., short DES. (729 m.).
		Line ascends the gently tilted Banaz plain.
328·7	..	Steel girder bridge (2 × 15 m.) over Banaz stream. Numerous culverts.
344·2	..	Steel girder bridge (15 m.) over Kalaştalar stream.
344·7	..	Steel girder bridge (15 m.) over Kordiran stream.
345·2	OTURAK (13)	Alt. 3,406 ft. (1,038 m.). W. (T. 9,000 gls.; Cr.); G.; Wb.; SLP.; PL. (402 m.).
		Steep gradients from Oturak to km. 355 (maximum 1 in 40), as line ascends through spurs of the Murat and Ahir Dağ, alt. *c.* 7,550 ft. (2,300 m.). There are many culverts and a few major works, the most important being:
349·9	..	Tunnel No. 21 (18 m.); covered gallery 42 m.

Km. from Izmir	*Stations and passing-loops*	*Remarks*
352·9	. . .	Tunnel No. 22 (205 m.); covered gallery 55 m.
353·4	. .	Tunnel No. 23 (60 m.).
355·1	. .	Highest point of line, alt. 4,104 ft. (1,251 m.). Line enters uppermost valley of the Porsuk.
357·8	DUMLUPINAR (14)	Alt. 4,009 ft. (1,222 m.); G.; Wb.; SLP.; PL., LS. (772 m.). Line keeps to an enclosed valley, crossing numerous culverts.
364·4	. .	Bridge (13 m.).
372·1	YILDERIMKEMAL (24)	Formerly Küçükköy. Alt. 3,780 ft. (1,152 m.). W. (T. 18,000 gls.; Cr., SP., well); G., Wb.; SLP.; PL. (402 m.).
374–7	. .	Line crosses 3 steel girder bridges (each 15 m.) over the Porsuk, and a large number of culverts.
395·8	BALMAHUT (11)	Alt. 3,484 ft. (1,062 m.). G.; Wb.; PL. (402 m.).
404·1	. .	Steel girder bridge (13 m.) over Dulay stream.
404·5	. .	Steel girder bridge (20 m.) over Dulay stream.
406·6	GECIKHAMAM (13)	Or Göcik Hamam. Alt. 3,310 ft. (1,009 m.). PL. (314 m.).
407·4	. .	Steel girder bridge (15 m.). Line is joined by Route 17, and the two lines run side by side into Afyonkarahisar.
419·9	AFYONKARAHISAR Town (2) (*Gaz.*)	'Afyon town.' Alt. 3,304 ft. (1,007 m.). ES.; 2 Tbl.; W. (T. 9,000 gls.; Cr., SP., well); G.; Wb.; SLP.; ELP.; PL., 2 LS., 2 DES. (1,320 m.).
421·7	AFYONKARAHISAR Junction (AFYON ANA) (*Gaz.*)	Alt. 3,307 ft. (1,008 m.). 3 platform tracks; ES. (round-house, 4 roads); Tbl. (20 m.); W. (T. 28,000 gls.; Cr., SP., well); RpS (heavy); oil-storage tanks; G.; Wb.; SLP.; PL., LS., MY. (5), 3 DES. (3,370 m.). Junction with Routes 8 (to Eskişehir and Konya) and 17 (Aydin and Izmir).

15. MANISA–BALIKESIR–BANDIRMA

(*Completed 1912; see page 243*)

Route

Manisa–Balikesir	108·5 miles	174·6 kilometres
Balikesir–Bandirma	62·4 ,,	100·5 ,,
	170·9	275·1

Junctions

Manisa is the junction on the Izmir–Afyonkarahisar line (Route 14). Balikesir is the junction for the line to Kütahya and Alayunt (Route 16).

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, wooden. Maximum axle-load, 13½ metric tons. Minimum radius of curves, 300 m. frequent. Maximum gradient: northwards, 1 in 50; southwards, 1 in 40. Maximum distance between stations, 17 km.

Speed and capacity

Overall time (including stops): Manisa–Balikesir, passenger trains 4½ hours, goods trains 8 hours; Balikesir–Bandirma, passenger trains 2½ hours, goods trains 4 hours. Capacity of line: Manisa–Balikesir, 10 trains each way in 24 hours; Balikesir–Bandirma, 13 trains.

Miscellaneous

Marshalling yards at Manisa, Soma, Balikesir, Bandirma; engine-sheds at Manisa, Akhisar, Balikesir, Bandirma; light repairs are undertaken at these sheds; heavy repairs at Halkapinar workshops (Route 14).

GENERAL DESCRIPTION

This line, formerly a branch of the French-owned Izmir–Afyonkarahisar line, connects Izmir with the Sea of Marmara.

Manisa–Balikesir. From Manisa the line branches directly north across the Gediz valley, crossing the river just below the junction of the Kum tributary. It follows the right bank of this river, passing through an agricultural region. Kapakli is about 5 miles from the *nahiye* town of Palamut, on the site of Apollonis, an ancient military post. Akhisar, the chief town of the district, is a small commercial town, on the site of classical Thyatira, and the line makes a detour in order to pass through it.

From Akhisar the line turns north-west to cross a saddle into the valley of the Bakir river, which it follows to Soma, a small town with flour-mills, a textile industry, and some lignite mines. From Soma the line rises steadily along the Yağcili valley to cross the Madra Dağ watershed into the catchment of the Simav. There are some sharp bends and a few tunnels on both sides of the range.

Balikesir–Bandirma. The line crosses the Balikesir plain, mounts a low ridge, and then follows the valley of the Hatap to Susurluk on the Simav. Five miles farther on the valley opens out into the broad depression that contains lakes Apolyont and Manyas, and the railway and road to Balikesir are never far from each other as they skirt the eastern shores of Lake Manyas.

In the account of stations and their facilities given below only the

most important engineering works are included, and the full details of the bridges are not available. Throughout the course there are numerous culverts and small bridges.

DETAILED DESCRIPTION

Km. from Manisa	*Stations and passing-loops*	*Remarks*
0·0	MANISA (12) (*Gaz.*)	Alt. 164 ft. (50 m.). 3 platform tracks; ES.; Tbl.; W. (T. 18,000 gls.; Cr., SP., well); G.; Wb.; 2 SLP.; ELP.; PL., MY. (4), 4 short DES. (1,811 m.). Junction with Izmir–Afyonkarahisar line (Route 14); 66 km. from Izmir. Line crosses the broad Manisa plain (Manisa Ovasi) north-eastwards to enter the Kum valley. Several small steel girder bridges over channels have to be crossed in the first 3 km. Those over the Nif (or Kemalpaşa) stream and over the Gediz are important.
3·8	..	Steel girder bridge (4 × 18 m.) over Nif stream.
6·8	..	Steel girder bridge (6 × 13 m.) over Gediz.
11·5	KARAAĞAÇLI (7)	Alt. 115 ft. (35 m.). G.; LP.; PL., LS. (390 m.).
c. 16	..	Line crosses the Manisa–Akhisar motor-road in open country.
18·6	SARUHANLI (5)	Alt. 141 ft. (43 m.). G.; LP.; PL. (418 m.). Line and road pass into Urganci defile, through which Kum river makes a passage among low hills.
24·0	ISHAKÇELEBI (13)	Alt. 184 ft. (56 m.). W. (T. 4,000 gls.; Cr.); G.; Wb.; LP.; PL. (420 m.). The station name was formerly Mikhayli.
37·2	KAYIŞLAR (4)	Alt. 269 ft. (82 m.). G.; LP.; PL. (471 m.). Soma motor-road diverges direct for Harta.
41·6	KAPAKLI (3)	Alt. 292 ft. (89 m.). G.; LP.; PL. (429 m.).
44·8	ÇIFTLIK (7)	Alt. 282 ft. (86 m.). G.; LP.; PL. (153 m.). A small tributary of the Kum is crossed just before the station.
51·3	AKHISAR (8) (*Gaz.*)	Alt. 331 ft. (101 m.). ES., Tbl.; W. (T. 18,000 gls.; Cr.); G.; Wb.; LP.; PL., 2 LS., 2 DES. (1,080 m.).
59·5	SÜLEYMANLI (11)	Alt. 351 ft. (107 m.). G.; LP.; PL., LS. (418 m.).
70·2	HARTA (11)	Alt. 778 ft. (237 m.). W. (T. 4,000 gls.; Cr.); G.; LP.; PL., LS. (378 m.). Line enters the Bakir valley.
80·8	KIRKAĞAÇ (12) (*Gaz.*)	Alt. 509 ft. (155 m.). G.; Wb.; LP.; PL., DES. (746 m.). The bridge over the Bakir river at km. 88 is small (5 m.).
92·4	SOMA (14) (*Gaz.*)	Alt. 443 ft. (135 m.). Tbl.; W. (T. 13,000 gls.; Cr.); G.; Wb.; LP.; PL., 3 LS., 2 DES., MY. (2,104 m.). Station is on right bank of Bakir, town on opposite bank on the lower wooded slopes of Çamlica Dağ.

Km. from Manisa	*Stations and passing-loops*	*Remarks*
106·8	BEYCE (13)	Alt. 794 ft. (242 m.). G., LP.; PL., LS. (628 m.). The alinement of the railway becomes more difficult, the line winding a good deal, particularly between km. 113 and 114, where it crosses a ravine.
113	..	Steel girder bridge (20 m.).
119·9	SAVASTEPE (8)	Alt. 850 ft. (259 m.). W. (T. 9,000 gls.; Cr.); G.; Wb.; LP.; PL., LS. (629 m.). The small town of Giresun is to the east of the line and used to give its name to the station. Line descends to cross the Yağcili stream.
122·5	..	Girder bridge (20 m.). Line climbs 1 in 50.
127·7	KARACALAR (14)	Alt. 1,004 ft. (306 m.). PL. (295 m.) only. Steep gradients and sharp curves as the line rises to the Aegean–Marmara watershed.
128·5	..	Viaduct (4×30 m.+10 m.).
129·5	..	Viaduct (6×30 m.).
131–3	..	2 tunnels (410 m. and 136 m.).
c. 135	..	Watershed 1,575 ft. (480 m.).
141·6	SOĞUCAK (16)	Alt. 791 ft. (241 m.). W. (T. 9,000 gls.; Cr.); G.; Wb.; LP.; PL., LS. (627 m.). Line follows the valley of the Üzümcü stream closely, with steep downward gradients and some sharp curves.
144·0	..	Tunnel (140 m.).
c. 147	..	2 tunnels (200 m., 65 m.); sharp curves.
147·5–150	..	3 tunnels (no details); viaduct (6×30 m.).
157·8	ÇUKURHÜSEYIN (17)	Alt. 512 ft. (156 m.). W. (T. 9,000 gls.; Cr.); G.; Wb.; LP.; PL., LS. (609 m.). Bridge (2×20 m.). Line leaves Üzümcü valley, crosses open plateau, and descends towards Balikesir plain.
174·6	BALIKESIR (7) (*Gaz.*)	Alt. 430 ft. (131 m.). ES.; Tbl.; W. (T. 9,000 gls.; Cr.); G.; Wb.; 2 SLP.; PL., small MY. (3), 2 DES. (1,372 m.). Special SLP. at airfield. Junction with line to Kütahya and Alayunt (Route 16).
181·4	PL. (15)	Alt. 358 ft. (109 m.). PL. (282 m.) only, near Köseler village. Line crosses Kizikli stream and rises to nearly 1,000 feet (300 m.), then descends along Hatap valley.
196·7	YENIKÖY 11)	Alt. 764 ft. (233 m.). W. (T. 9,000 gls.; Cr.); G.; Wb.; LP.; PL., LS. (668 m.). 2 tunnels (250 m., 300 m.).
207·2	OMERKÖY 13	Alt. 348 ft. (106 m.). G.; LP.; PL., LS., DES. (899 m.). Line follows Hatap tributary of the Simav.
211		Tunnel (115 m.). Bridge over Hatap stream.

Km. from Manisa	*Stations and passing-loops*	*Remarks*
220·1	SUSURLUK (SUSIĞIRLIK) (8) (*Gaz.*)	Alt. 125 ft. (38 m.). W. (T. 9,000 gls.; Cr.); G.; Wb.; LP.; PL., LS. (633 m.). Station on left bank of Simav river, alongside Bandirma–Balikesir motor-road. Line runs parallel to the Simav as far as Yahyaköy (about 8 km.), and then diverges towards Lake Manyas.
228·0	M. KEMALPAŞA (8)	Alt. 102 ft. (31 m.). Halt and PL. The halt is near the village of Yahyaköy, where a motor-road bridge spans the Simav river. The town of Mustafa Kemalpaşa is about 20 km. by motor-road to the east (*Gaz.*).
235·8	OKÇUGÖL (12)	Alt. 105 ft. (32 m.). G.; Wb.; LP.; PL., LS. (612 m.).
c. 241	..	Bridge (60 m.) over Kara stream.
247·7	AKSAKAL (15)	Alt. 233 ft. (71 m.). G.; Wb.; LP.; PL., LS. (612 m.). Station is about 3 km. from south-east corner of Lake Manyas. Line goes north parallel to the east shore.
262·6	SIĞIRCI (10)	Alt. 89 ft. (27 m.). W. (T. 9,000 gls.; Cr.); G.; Wb.; LP.; PL., LS. (618 m.). Line is closely followed by motor-road.
272·4	PL. (3)	PL. (274 m.) only. Line descends with maximum gradient, 1 in 40.
275·1	BANDIRMA (*Port*)	Alt. 3 ft. (1 m.). ES.; Tbl.; RpS.; coal-stack; W. (T. 18,000 gls.; Cr., SP., well); G.; Wb.; LP.; MY. and several Sdgs. (2,234 m.). Station is to west of town alongside the wharf. This line passes through a small tunnel. A small extension line runs north-east along shore (900 m. long), the last 500 m. being double track and serving a wooden pier and a stone jetty (fig. 11).

16. BALIKESIR–KÜTAHYA–ALAYUNT

(*Completed 1932; see page 251*)

Distance: 163·2 miles, 262·7 kilometres.

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, wooden. Maximum axle-load, 20 metric tons. Minimum radius of curves, 250 m. frequent. Maximum gradient, 1 in 60 in both directions. Maximum distance between stations, 19 km.

Speed and capacity

Overall time (including stops): passenger trains 8 hours; goods trains 11 hours. Capacity of line, 12 trains in each direction in 24 hours.

Miscellaneous

Marshalling yards at Balikesir; engine-sheds at Balikesir, Tavşanli, Kütahya, and Alayunt, at which light repairs can be undertaken.

GENERAL DESCRIPTION

This line makes use of the Ivrindi–Tavşanli depression (I, p. 131), a structural feature which combines lowland and erosion valley, and forms the only feasible alinement for a railway direct from Balikesir to the Central Plateau. Even so, there are considerable difficulties for most of the way, and numerous tunnels, bridges, and other engineering works. It serves an inland agricultural region otherwise with very poor communications, and the lignite mines near Değirmisaz.

Crossing the Balikesir plain, the Simav river, and several tributaries, the line climbs the Killer valley and crosses the watershed between it and the Kirmasti. Here the Oçbaş river from the west and the Alaca and Emet rivers from the east form natural lines of passage, though the valleys are enclosed and wooded. As the plateau is approached the country opens out and difficulties are less.

In the description of stations given below, the engineering works are only very roughly summarized; these are from maps and other doubtful sources, and are only given as a rough guide to the type of constructional work along the line. There are said to be altogether 39 tunnels, totalling 6,162 metres. The last section, between Kütahya and Alayunt, was originally built as a branch from the Anatolian railway.

DETAILED DESCRIPTION

Km. from Balikesir	*Stations and passing-loops*	*Remarks*
0·0	BALIKESIR (15) (*Gaz.*)	Alt. 430 ft. (131 m.). ES.; Tbl.; W. (T. 9,000 gls.; Cr.); G.; Wb.; 2 SLP., PL., small MY. (3), 2 DES. (1,372 m.). Special SLP. at air-field. Junction with Izmir–Manisa–Bandirma line (Routes 14, 15). Line runs east-south-east almost straight across the Balikesir plain, crossing some fair-sized tributaries of the Simav, and the Simav itself immediately before reaching Çandir.
14·7	ÇANDIR (12)	Alt. 344 ft. (105 m.). G.; PL.; DES. (840 m.). Country is more undulating as the line turns north-east into the valley of the Dombey[1] tributary. This river is bridged about km. 24.

[1] The rivers and streams have many local names along their courses in this area. The names used in the description are those adopted in the general description of the region given in vol. I, pp. 128–31.

Km. from Balikesir	*Stations and passing-loops*	*Remarks*
27·0	NUSRET (18)	Alt. 364 ft. (111 m.). G.; SLP.; PL., 2 LS. Station is in the Killer valley about 8 km. south of Kepsut.
		Line now ascends the enclosed wooded valley of the Killer with an almost constant gradient of 1 in 66 and some sharp curves. There are many small bridges and 10 tunnels.
44·6	MEZITLER (12)	Alt. 755 ft. (230 m.). W. (T. 17,000 gls.; Cr.); G.; PL., LS. (840 m.).
		The line winds north-east out of the enclosed and difficult Killer valley and begins the climb over the watershed into the Kirmasti catchment. There are sharp curves, bridges, and 5 tunnels; gradient is 1 in 60 throughout.
56·5	DADA (12)	Alt. 1,381 ft. (421 m.). G.; PL., LS. (510 m.).
		Ascent is continued through similar country; 4 tunnels.
67·5	GAZELLIDERE (11)	Alt. 1,982 ft. (604 m.). G.; PL., LS. (840 m.). Station is near the watershed.
		Line descends through closely wooded country.
78·6	SELIMAĞA (11)	Alt. 1,775 ft. (541 m.). PL. (510 m.) only.
		Line follows the north bank of the Dursunbey (Balat) stream.
89·8	DURSUNBEY (14)	Alt. 1,332 ft. (406). ES.; W. (T. 26,000 gls.; Cr.); G.; Wb.; SLP.; PL., LS. (840 m.). The *kaza* town of Dursunbey is in the hills about 4 km. to the north.
		About km. 93 the Dursunbey joins the Oçbaş stream, and the combined stream turns north-east, then north, and north-west. The line follows the valley closely, with a number of bridges and 4 tunnels.
103·7	ÇINAR (15)	Alt. 1,040 ft. (317 m.). PL. (510 m.).
		About km. 111 the Oçbaş or Balat stream joins the Alaca or upper Kirmasti, the combined stream forcing a passage northwards. The line crosses it and ascends the open valley of the Alaca eastwards. There are a number of bridges and 5 tunnels.
118·7	PIRIBEYLER (19)	Alt. 1,020 ft. (311 m.). W. (T. 13,000 gls.; Cr.); G.; PL., LS.
		Country is more open, less heavily wooded, and there are few difficulties. Bridging seems to be confined to small spans over side ravines.
137·2	GÖKÇEDAĞ (15)	Alt. 1,181 ft. (360 m.). PL. (510 m.).
		About km. 142 the line leaves the upper Kirmasti which comes in from the south and follows the more open valley of the Emet south-eastwards. There are many bridges and about 4 tunnels.
152·6	BALIKÖY (11)	Alt. 1,417 ft. (432 m.). G.; PL., LS. (840 m.). The station is used for loading lignite.

Km. from Balikesir	*Stations and passing-loops*	*Remarks*
		The line crosses and recrosses the Emet stream and passes through 3 tunnels.
163·5	DEĞIRMISAZ (12)	Alt. 1,709 ft. (521 m.). W.; G.; SLP.; PL., 3 LS. Another loading station for lignite from the neighbouring mines.
		Line turns north-east out of the Emet valley, passes through a tunnel, and crosses 2 streams.
175·0	DEMIRLI (14)	Alt. 2,218 ft. (676 m.). W. (T. 4,000 gls.); G.; Wb.; PL. (840 m.).
		Line crosses watershed into the upper basin of the Tavşanli Koca river, passing through 3 tunnels.
188·8	EMIRLER (14)	Alt. 2,831 ft. (863 m.). G.; PL., LS. (840 m.).
		Country opens out and becomes more bare of trees. The Tavşanli Koca river is crossed at about km. 197.
202·4	TAVŞANLI (17) (*Gaz.*)	Alt. 2,700 ft. (823 m.). ES. (roundhouse); Tbl.; W. (T. 13,000 gls.; Cr.); G.; ELP.; PL., LS. (840 m.).
		Line ascends the broad Tavşanli plain up the right bank of the Koca, crossing several small and one long bridge (5 × 20 m.).
219·2	GÜZELYURT (10)	Or Aliköy. Alt. 3,150 ft. (960 m.). PL. (510 m.).
		Line crosses watershed between the Koca and the upper tributaries of the Porsuk, passing through bare plateau country.
228·8	KÖPRÜÖREN (10)	Alt. 3,396 ft. (1,035 m.). W. (T. 26,000 gls.; Cr.); G.; PL., LS. (840 m.).
		Line follows right bank of the Porsuk.
239·0	DEMIRCIÖREN (14)	Alt. 3,330 ft. (1,015 m.). PL. (510 m.).
252·6	KÜTAHYA (10) (*Gaz.*)	Alt. 3,251 ft. (991 m.). W. (T. 5,000 gls.; Cr.); G.; Wb.; ELP.; SLP.; PL., 2 LS., DES. (1,337 m.).
262·7	ALAYUNT	Alt. 3,041 ft. (927 m.). ES. (3 roads); Tbl. (13·5 m.); RpS. (light); W. (T. 8,000 gls.; Cr., SP., well); G.; SLP.; PL., 2 LS., short DES. (1,250 m.). Junction with Eskişehir–Konya line (Route 8).

17. IZMIR–AYDIN–KARAKUYU–AFYONKARAHISAR

(*Completed 1936*[1]*; see pages 242, 251*)

Route

Izmir–Aydin	81·2	miles	130·6	kilometres
Aydin–Karakuyu	162·0	,,	260·7	,,
Karakuyu–Afyonkarahisar	70·9	,,	114·2	,,
	314·1		505·5	

[1] The line as far as Dinar, 15 km. short of Karakuyu, was completed in 1889; the last section to Afyonkarahisar only in 1936.

Branch lines

Kizilcullu–Buca	1·5 miles	2·4 kilometres
Gaziemir–Seydiköy	0·9 „	1·5 „
Torbali–Çatal–Ödemiş	38·5 „	62·0 „
Çatal–Tire	7·0 „	11·3 „
Ortakler–Söke	14·9 „	24·0 „
Goncali–Denizli	5·8 „	9·3 „
Sütlâç–Çivril	19·9 „	32·0 „
	88·5	142·5

Permanent way and stations

Gauge, normal (1,435 mm.). Double track to Kizilcullu (6 km.); single track beyond Kizilcullu. Rails: Izmir–Karakuyu, 69 lb. per yd. (34·5 kg./m.); beyond, 79 lb. per yd. (39·5 kg./m.). Sleepers: wooden to Karakuyu; steel beyond. Maximum axle-load: 13·5 metric tons to Karakuyu; 20 metric tons beyond. Minimum radius of curves, 250 m. between Çamlik and Ortakler. Maximum gradient, 1 in 50 both directions. Maximum distance between stations, 20 km.

Speed and capacity

Overall time (including stops):

Izmir–Aydin, passenger trains 4 hours, goods trains 8 hours.
Aydin–Karakuyu, passenger trains 9 hours, goods trains 14 hours.
Karakuyu–Afyonkarahisar, passenger trains 3½ hours, goods trains 5 hours.

Capacity of line: Izmir–Aydin, 14 trains each way in 24 hours; Aydin–Karakuyu, 13 trains each way in 24 hours; Karakuyu–Afyonkarahisar, 10 trains each way in 24 hours.

Miscellaneous

Marshalling yards at Izmir, Selçuk, Afyonkarahisar (junction). Engine-sheds at Izmir, Selçuk, Çamlik, Aydin, Nazilli, Dinar, Afyonkarahisar (town and junction). Locomotive repair shops, Izmir and Afyonkarahisar.

GENERAL DESCRIPTION

As far as Karakuyu this line was built and formerly operated by a British company.

Izmir–Aydin. From Izmir the line passes to the east of the town and southwards across a small well-cultivated plain, watered by the

Meles, with fruit- and market-gardens. The Meles watershed at about 500 feet is crossed between Gaziemir and Cumaovasi stations. At Develiköy the line crosses the Boğazi (Tahtali) stream, down the valley of which can be seen the mountains of the island of Samos. Then the line bends east to Kayas, crossing a marshy plain, and south-east to Torbali, the important junction for the branch line which serves the Küçük Menderes valley.

The main line continues across a low-lying marshy plain, leaving lakes Cellat on the west and Belevi on the east, and using the valley of the lower Küçük Menderes as far as Selçuk, in the fertile plain of ancient Ephesus. A difficult section follows: the line leads through the enclosed valley between the Kapili Dağ and Ovacik Dağ, with many cuttings, embankments, small bridges, and some tunnels, rising to about 770 feet at Çamlik, the line dominating a rocky gorge. The descent to the Büyük Menderes is hardly less difficult, but in the broad valley of the latter, the northern edge of which is followed, the only obstacles are the streams which enter the valley from the north. A branch line leads from Ortakler to Söke farther down the valley, and this place is connected by motor-road with the small port of Kuşadasi.

Aydin–Karakuyu. To Sarayköy there are no difficulties: low bridges across the side streams, culverts, and embankments are the only works; but at Sarayköy the valley divides, the main trough being occupied by the Emir (Çörüh, *class.* Lycus). The curious petrifying springs of Hierapolis (I, photo. 63, p. 137) are within a few miles of Goncali, which is the junction of a short branch line to Denizli. Beyond Böceli the line enters the Boğaz Kesen defile, and crossing the Emir begins the steady ascent to the plateau, which is reached near Bozkurt. Here the country opens out and the line runs along the Acigöl lake, keeping between 2,700 and 3,000 feet to Dinar, which was the terminus of the old British line for many years. At Sütlâç a branch line leaves for Çivril. The main line meets with some difficulties near Dinar where it has to make a detour to cross a pass, rising with a gradient of 1 in 50, and with curves of 300-metre radius. At Karakuyu it meets the new line from Afyonkarahisar, completed by the State in 1936.

Karakuyu–Afyonkarahisar. There are few engineering difficulties in this last section which keeps along the plateau west of the Kükürt Dağ. There are, however, a number of bridges shown on maps, the details of which are not available, and six small tunnels totalling 649 metres.

DETAILED DESCRIPTION

Km. from Izmir	*Stations and passing-loops*	*Remarks*
0·0	IZMIR (ALSANCAK) (2) (*Port*)	Alt. 7 ft. (2 m.). ES. (round-house, 20 engines); Tbl.; RpS.; coal-stack; W. (T., 2 Cr., EP., well); G.; Wb.; SLP.; MY., Sdgs. (11,019 m.). Extension to railway pier with branch to gasworks. (*See* plan of Izmir, fig. 16.)
		Low bridge over Meles (2 × 12 m. + 15 m.).
2·2	HILÂLKEMER (4)	Alt. 36 ft. (11 m.). Sdgs. (845 m.). Junction, and triangular connexion with Route 14. To Europeans this station used to be known as 'Caravan Bridge'.
6·3	KIZILCULLU (8)	Alt. 203 ft. (62 m.). G.; SLP.; Sdgs. (113 m.). Junction of small suburban line (2·4 km.) to Buca.
		Bridge over Meles (2 × 12 m. + 15 m.).
14·1	GAZIEMIR (7)	Alt. 423 ft. (129 m.). G.; PL., LS. (983 m.). Junction of small branch line (1·5 km.) to Seydiköy, a country resort.
21·3	CUMAOVASI (7)	Alt. 338 ft. (103 m.). G.; PL., LS. (250 m.). Village is 3 km. to west.
28·1	DEVELIKÖY (8)	Alt. 226 ft. (69 m.). PL., LS., DES. (580 m.).
		Bridge (2 × 10 m.) over Tahtali (Boğazi) stream.
36·6	KAYAS (KIYAS) (7)	Alt. 174 ft. (53 m.). PL., LS., DES. (493 m.).
43·1	KUŞÇUBURNU (6)	Alt. 164 ft. (50 m.). W. (T. 4,500 gls.; Cr.); G.; SLP.; PL., DES. (372 m.).
48·6	TORBALI (3)	Alt. 144 ft. (44 m.). W. (T., Cr.); G.; SLP.; 2 PL., 2 LS., 2 DES. (1,763 m.). Junction with line up the Küçük Menderes valley for Tire and Ödemiş, as below.

Küçük Menderes Branch Line

0	TORBALI	..
5	GURGUR	Distances given from Torbali.
14	ARIKBAŞI	..
20	ÇIPLAK	..
30	BAYINDIR (*Gas.*)	..
37	ÇATAL	Junction for branch to Tire (11·3 km.), with bridge over Küçük Menderes (*Gas.*).
45	DERBEBAŞI	..
52	ILKURSÜN	Or Haciilyas.
62	ÖDEMIŞ (*Gas.*)	..

51·2	TEPEKÖY (8)	PL., 2 DES. (200 m.).
		Line crosses the marshlands of the Cellat Göl, and follows the course of the Küçük Menderes southwards. The old station at Cellat (km. 55·9) appears to have been closed. There are several small bridges and culverts.

Km. from Izmir	*Stations and passing-loops*	*Remarks*
59·0	SAĞLIKDURAĞI (SAĞLIK) (7)	Alt. 52 ft. (16 m.). W. (T. 3,000 gls.; Cr.); G.; SLP.; PL., LS. (556 m.).
66·3	KOZPINAR (11)	Alt. 36 ft. (11 m.). G.; SLP.; PL., DES. (510 m.). Line turns south-west.
c. 73	..	Bridge over Küçük Menderes; 4 or 5 spans, total length *c.* 60 m. Line turns south-west.
77·1	SELÇUK (10) (AYASOLUK, *Gaz.*)	Alt. 62 ft. (19 m.). ES. (round-house); Tbl.; W. (T. 9,500 gls.; Cr.); G.; Wb.; SLP.; PL., MY., Sdgs. (1,650 m.). Motor-road to Kuşadasi. Line leads south between the Kapili Dağ and Ovacik Dağ and passes through a rocky gorge where much engineering is necessary. 3 tunnels (154 m., 280 m., and 1,000 m.) at *c.* km. 79, 81, and 85 respectively, the last close to Çamlik station.
86·8	ÇAMLIK (AZIZIYE) (13)	Alt. 768 ft. (234 m.). ES.; Tbl.; W. (T. 3,000 gls., Cr.); G.; SLP.; PL., several Sdgs. (1,531 m.). Line turns east through enclosed valley leading to the valley of the Büyük Menderes.
c. 93·5	..	3 high bridges close together. The middle bridge has a brick arch of *c.* 18 m. span; the others have plate girders on stone piers.
100·0	ORTAKLER (9)	Alt. 200 ft. (61 m.). Tbl.; W. (T. 10,500 gls.; Cr.); G.; PL., numerous Sdgs. (2,899 m.). Station used to be known as Balaçik, sometimes as Pinarbaşi. It is the junction for the branch line to Söke, which goes south along the eastern flank of the Gümüş Dağ.

Branch Line to Söke

0·0	ORTAKLER	..
7	MORALI	Alt. *c.* 95 ft. (29 m.). Distances from Ortakler.
17	SÖKEKEMERI	..
24	SÖKE (*Gas.*)	Alt. *c.* 125 ft. (38 m.). Motor-road to Kuşadasi.

From Ortakler the main line leads eastwards up the broad trough of the Büyük Menderes to Sarayköy, keeping along the north side of the valley. There are numerous bridges and culverts, mostly low, the former generally with plate-girder spans of about 10 m., though some have as many as 10 spans, on masonry piers.

102·9	*Derekôy*	Halt only.
108·6	GERMENCIK (6)	Alt. 213 ft. (65 m.). G.; SLP.; PL., 2 LS. (929 m.).
114·6	ERBEYLI (6)	Alt. 167 ft. (51 m.). G.; SLP.; PL., LS. (563 m.); formerly Erikli station.

The Yalki stream is crossed about km. 118.

Km. from Izmir	*Stations and passing-loops*	*Remarks*
120·2	INCIRLIOVA (KARAPINAR) (10)	Alt. 154 ft. (47 m.). W. (T. 3,000 gls.; Cr.); G.; SLP.; PL., 2 LS. (1,021 m.). Cart-road leads south to bridge over Büyük Menderes.
125·3	*Osmanbük*	Halt only.
130·6	AYDIN (11) (*Gaz.*)	Alt. 217 ft. (66 m.). ES. (2 roads); Tbl. (13·5 m.); W. (T. 8,500 gls.; Cr., well); G.; Wb.; SLP.; PL., several Sdgs. (1,955 m.). Main motor-road leads south over Büyük Menderes to Çine and Muğla.
c. 133	..	Bridge over Tabakane stream.
137·6	*Imamköy*	Halt only.
141·1	UMURLU (9)	Alt. 180 ft. (55 m.). G.; SLP.; PL., LS. (424 m.). Bridge over Mustuca stream.
146·2	*Beyköy*	Halt only.
		Bridges over Kocan and Köşk streams.
149·7	KÖŞK (5)	Alt. 236 ft. (72 m.). G.; SLP.; PL., LS. (476 m.).
153·2	*Kirkahve*	Halt only.
155·1	ÇIFTEKAHVE (5)	Alt. 197 ft. (60 m.). G.; SLP.; PL., LS. (467 m.).
160·0	SULTANHISAR (5)	Alt. 269 ft. (82 m.). W. (T. 14,000 gls.; Cr.); G.; SLP.; PL., LS. (850 m.). Near the station are the ruins of Nysa, an ancient town destroyed in the 14th century A.D.
		Bridge over Malkaç stream.
165·0	ATÇA (11)	Alt. 259 ft. (79 m.). G.; SLP.; PL., LS., DES. (544 m.).
170·0	*Isabeyli*	Halt only.
175·8	NAZILLI (12) (*Gaz.*)	Alt. 282 ft. (86 m.). ES. (2 roads); Tbl. (13·5 m.); W. (T. 9,000 gls.; Cr., SP., well); G.; Wb.; SLP.; PL., numerous Sdgs. (2,553 m.). Motor-road leads south over Büyük Menderes to Bozdoğan.
181·2	*Hacibeyli*	Halt only.
184·1	*Hamzali*	Halt only.
187·5	KUYUCAK (12)	Alt. 299 ft. (91 m.). W. (T. 3,500 gls.; Cr.); G.; Wb.; SLP.; PL., 2 LS. (1,167 m.).
194·4	*Gevenez*	Halt only.
199·2	HORSUNLU (14)	Alt. 361 ft. (110 m.). W. (T. 4,000 gls.; Cr.); G.; SLP.; PL., DES. (674 m.).
207·4	*Genceli*	Halt only.
213·2	BURHANIYE (18)	Alt. 443 ft. (135 m.). G.; SLP.; PL., LS. (593 m.).
c. 230	..	Line crosses the Büyük Menderes by bridge, 3 spans of 24 m., and smaller openings.
231·3	SARAYKÖY (10) (*Gaz.*)	Alt. 361 ft. (110 m.). Tbl.; G.; Wb.; SLP.; PL., 2 LS., DES. (1,453 m.). Sarayköy is at the junction of the Emir river and the Büyük Menderes, the latter coming into the lowland trough from the north. Line continues east up the left bank of the Emir river.
241·3	ŞAMLI (10)	Alt. 545 ft. (166 m.). G.; SLP.; PL., LS. (426 m.).

Km. from Izmir	*Stations and passing-loops*	*Remarks*
251·8	GONCALI (9)	Alt. 673 ft. (205 m.). W. (T. 9,000 gls.; Cr.); Tbl.; G.; SLP.; PL., 3 LS. (1,094 m.). Junction with short branch (9·3 km.) south to Denizli (*Gaz.*).
		Line crosses several bridges and passes through some tunnels. The gradient increases to 1 in 70.
261·1	BÖCELI (BUCALI) (14)	Alt. 902 ft. (275 m.). W. (T. 9,000 gls.; Cr.); G.; SLP.; PL., LS., 2 DES. (814 m.).
		Line enters the Boğaz Kesen, a defile 4 km. long.
		The line crosses the Emir by a bridge (3 × 18 m.) on piers about 18 m. high, and begins ascent to the plateau, gradients 1 in 66.
275·2	KOCABAŞ (8)	Alt. 1,437 ft. (438 m.). G.; SLP.; PL., LS., DES. (296 m.).
		Bridges over Koca and Emir rivers?
283·8	KAKLIK (9)	Alt. 1,755 ft. (535 m.). W. (T. 9,000 gls.; Cr.); G.; Wb.; SLP.; PL., 2 LS. (1,055 m.).
		Gradient increases to 1 in 50.
292·6	PL. (11)	PL. only.
303·2	BOZKURT (6)	Alt. 2,841 ft. (866 m.). W. (T. 15,000 gls.; Cr.); G.; SLP.; PL., LS. (1,025 m.). Also known as Hamidiye.
309·0	ÇARDAK (20)	Alt. 2,792 ft. (851 m.). G.; SLP.; PL., LS. (551 m.). Station is near west end of Acigöl (lake).
		Line follows north shore of lake for about 8 km., then diverges from it.
328·8	TAZKIRI (4)	Alt. 2,861 ft. (872 m.). ES.; G.; PL., LS. (633 m.).
333·2	PL. (11)	PL. only.
344·0	EVCILAR (13)	Alt. 2,927 ft. (892 m.). G.; SLP.; PL., LS. (593 m.).
357·1	SÜTLÂÇ (20)	Alt. 2,805 ft. (855 m.). W. (T. 9,000 gls.; Cr.); Tbl.; G.; SLP.; PL.; LS., DES. (753 m.). Junction with branch (32 km.) north-west to Çivril.

Branch Line to Çivril

0·0	SÜTLÂÇ	..
15	SUNDURLU	Distances from Sütlâç.
24	INCEKÖY	..
32	ÇIVRIL	..

376·6	DINAR (15) (*Gaz.*)	Alt. 2,845 ft. (867 m.). ES. (2 roads); Tbl.; W. (T. 9,000 gls.; Cr.); G.; SLP.; PL., 3 LS. (1,417 m.).
391·3	KARAKUYU (13)	Alt. 3,314 ft. (1,010 m.). G.; SLP.; PL., several Sdgs. (860 m.); turning triangle. Junction with line to Eğridir, Burdur, and Isparta (Route 18). Trains reverse for Afyonkarahisar.
404·5	KAZANPINAR (15)	Alt. 3,514 ft. (1,071 m.). G.; PL., LS. (860 m.).
419·6	EKINOVA (19)	G.; PL., LS. (860 m.).

Km. from Izmir	*Stations and passing-loops*	*Remarks*
438·1	SANDIKLI (20) (*Gaz.*)	Alt. 3,507 ft. (1,069 m.). W. (T., Cr.); G.; Wb.; PL., LS. (860 m.).
457·6	ÇIĞILTEPE (11)	Alt. 3,914 ft. (1,193 m.). G.; PL., LS. (860 m.).
468·2	KOCATEPE (12)	Alt. 4,242 ft. (1,293 m.). W. (T. 14,000 gls.; Cr.); G.; PL., LS. (860 m.).
480·6	TINAZTEPE (14)	Alt. 3,566 ft. (1,087 m.). G.; PL., LS. (860 m.).
494·5	PL. (9)	Alt. 3,330 ft. (1,015 m.). PL. only.
503·7	AFYONKARAHISAR Town (2) (*Gaz.*)	Alt. 3,304 ft. (1,007 m.). ES.; 2 Tbl.; W. (T. 9,000 gls.; Cr., SP., well); G.; Wb.; SLP.; ELP.; PL., 2 LS., 2 DES. (1,320 m.).
505·5	AFYONKARAHISAR Junction (AFYON ANA)	Alt. 3,307 (1,008 m.). 3 platform tracks; ES. (round-house, 4 roads); Tbl. (20 m.); W. (T. 28,000 gls.; Cr., SP., well); RpS. (heavy); oil-storage tanks; G.; Wb.; SLP.; PL., LS., MY. (5), 3 DES. (3,370 m.). Junction with Routes 8 (to Eskişehir and Konya) and 14 (Aydin, via Uşak and Manisa).

18. KARAKUYU–EĞRIDIR

(*Completed 1912; see page 242*)

Distance: 49·5 miles, 79·7 kilometres

Branch lines

Baladiz–Burdur	14·8 miles	23·8 kilometres
Bozanönü–Isparta	8·6 „	13·8 „

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails: 69 lb. per yd. (34·5 kg./m.) on main line; 79 lb. per yd. (39·5 kg./m.) on branches. Sleepers: wooden on main line; steel on branch lines. Maximum axle-load, 15 metric tons. Maximum distance between stations, 25 km. (Kuleönü to Eğridir).

Speed and capacity

Overall time (including stops): mixed trains on line to Eğridir, 4 hours. Capacity of line: 8 trains each way in 24 hours.

Miscellaneous

No details of marshalling yards available; engine-sheds at Çapali and Eğridir, where light repairs can probably be undertaken.

GENERAL DESCRIPTION

This line is the last section of the old British-built and British-

owned line from Izmir through Aydin to Eğridir. The two branches Baladiz–Burdur and Bozanönü–Isparta were built in 1936 (p. 251).

The main line goes south-east from Karakuyu between the Elma Dağ (Söğüt Dağlari) and the Kükürt Dağ to the Keçiborlu valley which opens out to a plain at the northern end of Lake Burdur. At Baladiz, where the branch line goes south along the lake shore to Burdur, the main line turns north-east over a low col and then east to the Bozanönü Ovasi, where another branch goes south to Isparta. Between Bozanönü and Eğridir the line has to cross a high col.

Very few details of this line are available, and those given below are summarized from various sources, some of which are old and may be unreliable. Proposals have been made to extend the line from Burdur to Antalya on the south coast (p. 256), but no work had been reported by the end of 1941.

DETAILED DESCRIPTION

Km. from Karakuyu	*Stations and passing-loops*	*Remarks*
0·0	KARAKUYU (7)	Alt. 3,314 ft. (1,010 m.). G.; SLP.; PL., several Sdgs. (860 m.); turning triangle. Junction with line Izmir–Aydin–Afyonkarahisar (Route 17).
7·4	ÇAPALI (14)	Alt. 3,310 ft. (1,009 m.). ES. (2 roads); Tbl. (15·5 m.); W. (T. 7,000 gls.; Cr., SP., well); PL., Sdgs. (*c.* 1,030 m.).
21·7	KEÇIBORLU (13)	Alt. 3,294 ft. (1,004 m.). PL., Sdgs. (*c.* 800 m.).
34·8	BALADIZ (13)	Alt. 3,041 ft. (927 m.). W. (T.); PL., 2 LS. (*c.* 1,330 m.). Junction for branch line (*c.* 23·8 km.) to Burdur (*Gaz.*). ES.; LP. for 15 wagons; 2 LS. Journey takes 50 min. from Baladiz.
48·2	BOZANÖNÜ (7)	PL., LS. Junction for branch line (13·8 km.) to Isparta (*Gaz.*). ES.; 2 LS., DES. Journey takes 30 min. from Bozanönü.
55·1	KULEÖNÜ (25)	Alt. 3,032 ft. (924 m.). W. (T.); PL., Sdgs. (*c.* 1,030 m.).
79·7	EĞRIDIR (*Gaz.*)	Alt. 3,107 ft. (947 m.). ES.; Tbl. (15·5 m.); W. (T. 7,000 gls.; Cr., SP., well); Sdgs. (*c.* 1,730 m.).

19. MERSIN–YENICE

(Completed 1886; see page 245)

Distance: 26·8 miles, 43·2 kilometres

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb.

per yd. (39·5 kg./m.); sleepers, steel. Maximum axle-load, 18 metric tons. Minimum radius of curves, 700 m. Maximum gradient, 1 in 140. Maximum distance between stations, 17 km. (Tarsus–Yenice).

Speed and capacity

Overall time (including stops): mixed trains 1½ hours; goods trains 2 hours. Capacity of line: 18 trains each way in 24 hours.

Miscellaneous

Marshalling yards at Mersin and Yenice; engine-shed and light repairs at Mersin.

GENERAL DESCRIPTION

Though completed in 1886, this line was reconstructed after 1906. Some of the rails were removed during the War of 1914–18, but new ones have since been relaid. The line goes directly across the Seyhan plain with no steep gradients in either direction. The only works of any importance are bridges over stream-beds and irrigation channels.

DETAILED DESCRIPTION

Km. from Mersin	*Stations and passing-loops*	*Remarks*
0·0	MERSIN (8) (*Port*)	Alt. 20 ft. (6 m.). ES.; Tbl. (20 m.); coal-stack; W. (T., Cr., SP., well); G.; Wb.; 3 truck-mounted Cr.; SLP.; ELP.; MY. (9), 9 Sdgs. (4,545 m.). Rail connexion with Railway and Gazhane piers (pp. 103-5). Line runs north-east, followed closely by the Adana road.
2·0	..	Short branch (5·7 km.) eastwards to coast at Karaduvar.
7·2	..	Steel girder bridge (15 m.) over Kizil Dere.
7·5	..	Bridge (40 m.).
8·3	KARACAILYAS (11)	Alt. 75 ft. (23 m.). PL., LS., short DES. (445 m.).
10·4	..	Steel girder bridge (3 × 10 m.).
14·1	*Değirmen*	Halt only.
19·0	HACITALIP (7)	Alt. 89 ft. (27 m.). G.; PL., LS. (510 m.).
19·5	..	Steel girder bridge (3 × 9 m.) over Handek stream, which is generally dry.
26·0	TARSUS (17) (*Gaz.*)	Alt. 69 ft. (21 m.). W. (T., Cr.); G.; Wb.; PL., LS., 3 DES. (1,545 m.).
28·0	..	Steel girder bridge (34 m.) over Tarsus river.

Km. from Mersin	*Stations and passing-loops*	*Remarks*
30·8	*Külekboğazi*	Halt. Road to the Cilician Gates (Külek Boğazi) passes close to the halt.
34·1	..	Steel girder bridge (3 × 9 m.) over Kusun stream.
35·7	*Yumusoğlu*	Halt only.
38·1	*Meliki*	Halt only.
40·5	*Kamberhüyügü*	Halt only.
43·2	YENICE	Alt. 112 ft. (34 m.) Tbl. (20 m.); W. (T. 9,000 gls.; Cr.; SP.); G.; Wb.; Cr.; SLP.; PL., LS., MY. (3) (2,281 m.). Junction with Konya–Adana line (Route 9).

20. ISKENDERON–TOPRAKKALE

(*Completed 1913; see page 248*)

Distance: 36·8 miles, 59·2 kilometres.

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, wooden. Maximum axle-load, 20 metric tons. Minimum radius of curves, 400 m. Maximum gradient, 1 in 125. Maximum distance between stations, 19 km.

Speed and capacity

Overall time (including stops): mixed trains 2 hours. Capacity of line: 10 trains each way in 24 hours.

Miscellaneous

Marshalling yards at Toprakkale; engine-sheds at Iskenderon and Toprakkale, where light repairs can be undertaken.

GENERAL DESCRIPTION

From Iskenderon the line keeps close to the shore of the narrowing coastal plain and passes through spurs of the Gâvur Dağ which come right down to the sea at one point. By Payas, near the head of the Gulf of Iskenderon, the plain widens to the fertile 'plain of Issus', famous in history as the site of Alexander's decisive victory over the Persians in 333 B.C.; the line here gradually leaves the coast, avoiding marshes on the west, and passes north between low sandhill outliers of the Misis Dağ and the *nahiye* village of Erzin. The hills on either

side then close in to form the Kizik Boğazi or Toprakkale defile, a narrow corridor about 1,000 yards long and 300 yards wide, the historical 'Amanus Gates' (Pylae Amanicae). The ruins of an Armenian fortress, which gives its name to Toprakkale, is on a cliff west of the line.

DETAILED DESCRIPTION

Km. from Iskenderon	*Stations and passing-loops*	*Remarks*
0·0	ISKENDERON (3) (*Port*)	Alt. 7 ft. (2 m.). ES. (4 roads); Tbl. (20 m.); W. (T. 6,500 gls.; 2 Cr., SP., well); coal-stack; RpS.; G.; Wb.; ELP.; 3 LS., DES. Rail access to west jetty and transit sheds, with metre-gauge line to quarry (fig. 20).
		Line keeps close to shore.
2·7	AKÇAY (17)	Alt. 8 ft. (2·5 m.). W. (T. 6,500 gls.; Cr.). DES.
5·3	..	Junction for Sdgs. to jetty and harbour. MY. (4).
7·2	..	Steel and concrete bridge (10 m.).
		Line remains close to the sea, passing a cutting on a sharp curve through low outliers of the Gâvur Dağ.
10·1	..	Bridge (3×9 m.+7 m.) and short tunnel.
20·0	PAYAS (9) (*Port*)	Alt. 36 ft. (11 m.). G.; Wb.; PL., 2 LS. (1,675 m.). Sdg. (400 m.) towards south jetty furnished with decauville lines.
20·4	..	Steel and concrete bridge (2×7 m.) over Payas river.
		Line remains close to the sea, embanked at some places with stone at the water's edge, elsewhere 400 m. from the shore. There are numerous culverts over streamlets from the Gâvur Dağ, 3 tunnels at km. 22, 23, and 27, and two larger bridges as below:
27·9	..	Bridge (3×15 m.) over Rabal stream.
28·5	..	Bridge (3×20 m.) over Üzerli stream.
28·6	DÖRTYOL (19)	Alt. 82 ft. (25 m.). W. (T. 12,000 gls.; Cr.); G.; Wb.; ELP.; SLP.; PL., LS. (1,069 m.). The town is about 3 km. east of the line.
30·7	..	Steel girder bridge (3×20 m.) over Deli stream.
		Line crosses the 'plain of Issus', the scene of Alexander's victory.
47·3	ERZIN (12)	Alt. 207 ft. (63 m.). G.; PL., DES. (1,261 m.). Erzin village is about 5 km. east of the line.
56·0	..	Small tunnel; Toprakkale defile and embankment.
58·2	..	Steel girder bridge (3×20 m.).
59·2	TOPRAKKALE	Alt. 213 ft. (65 m.). ES. (3 roads); Tbl. (20 m.); W. (T. 12,000 gls.; Cr., SP., well); RpS. (light); G.; Wb.; ELP.; PL., MY. (5), DES. (2,853 m.). Junction with Adana–Aleppo line (Route 9).

21. ALEPPO–ÇOBANBEY–NUSAYBIN–TEL KOCHEK

(Çobanbey–Nusaybin section completed 1918; see page 247)

Route

Aleppo–Çobanbey	39 miles	63 kilometres
Çobanbey–Nusaybin	236 ,,	380 ,,
Nusaybin–Tel Kochek	44 ,,	71 ,,
	319	514

Branch lines

Derbesiye–Mardin, *c.* 19 miles; *c.* 30 kilometres.

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, wooden. Maximum axle-load, 19 metric tons. Minimum radius of curves, 600 m. Maximum gradient, 1 in 77 in both directions. Maximum distance between stations, 40 km.

Speed and capacity

Overall time Aleppo–Nusaybin (including stops): passenger trains 10 hours; goods trains *c.* 14 hours. Capacity of line: 7 trains in 24 hours in each direction.

Miscellaneous

Marshalling yards at Aleppo, Karkamiş, and Tel Kochek; engine-sheds at Aleppo, Muslimiye, Karkamiş, and probably at Çobanbey, Derbesiye, and Nusaybin, where light repairs may be undertaken.

GENERAL DESCRIPTION

This is part of the old German-built 'Baghdad Railway'; it was completed to Nusaybin towards the end of the War of 1914–18, though the extension to Tel Kochek was not built till some years afterwards. The line runs in Turkish territory, just north of the Turko-Syrian boundary, from Çobanbey to Nusaybin, the sections from Aleppo to Çobanbey and from Nusaybin to Tel Kochek being in Syria and operated by the *Lignes Syriennes de Baghdad.* Though these sections are not Turkish, they are so essentially part of the line that a brief description is included here.

From Aleppo the line to Muslimiye is the same as the last 14 km. of the Adana–Aleppo line (Route 9), when it bears north-eastwards to Çobanbey. In Turkish territory it crosses undulating but not hilly country till it approaches the Euphrates, when it has to descend to

the valley bottom, with a gradient of 1 in 83, to reach the Carablus bridge.

Beyond the Euphrates the line crosses open monotonous country with scattered settlements. Near Gültepe the surface is more broken up by wadis feeding the Belik (*class.* Belichas), which drains south to the Euphrates across the Jezireh; these stream-beds are all bridged. Near Resülayn the surface is similarly broken by tributaries of the Habur (Khabur), the country being dotted with mounds, the sites of ancient settlements. Beyond Nusaybin the line crosses the 'panhandle' of Syrian territory to Tel Kochek on the Iraq boundary, and is now continued to Mosul, Baghdad, and Basra, though there is a break in gauge.

The description given below is from different sources, some of which are old. Distances are only approximate, maps are bad, and there is very little information about the positions or details of bridges. The spelling of place-names and stations has been changed more than once by the Turks, and is different from that used by Syria. Alternate spellings have therefore been given. In the later sections of the line stations are far apart, Akçakale (Tilebyaz) being over 25 miles (40 km.) from Gocar. Passing-loops for military trains were in use during the War of 1914–18 between several of the stations from here onwards, at Abu Kubbah (*c.* km. 231) between Akçakale and Gocar; at Nustel (*c.* km. 254), which was in use before Gocar was built; and at Tel Hanzir (*c.* km. 293). It is possible that some of these still exist as disconnected loops. Büyük Cerelp may be one of these.

It must be emphasized that the details are fragmentary and unreliable. No information concerning the branch line from Derbesiye to Mardin is available, nor of the projected alternatives between Mardin or Arada and Diyarbekir (p. 257).

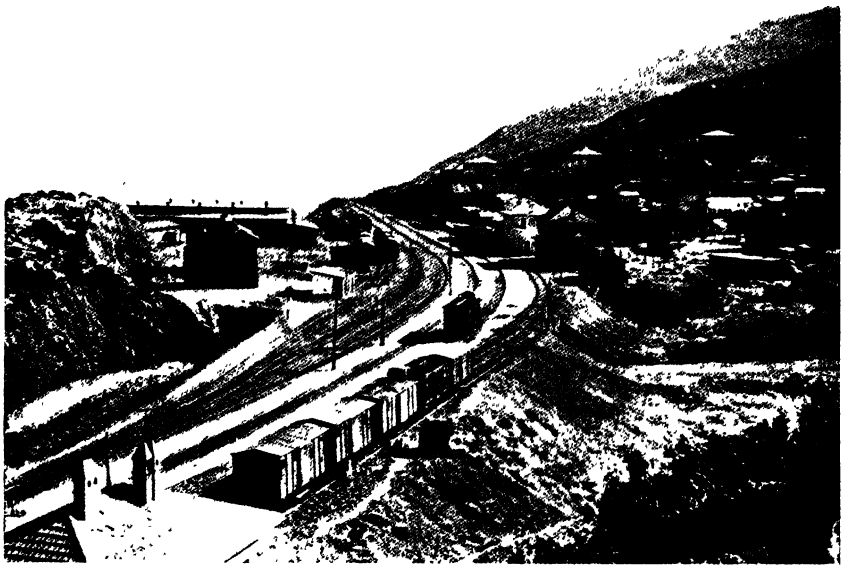
DETAILED DESCRIPTION

Km. from Aleppo	*Stations and passing-loops*	*Remarks*
0·0	ALEPPO (14)	Alt. 1,358 ft. (414 m.). ES. (round-house); Tbl.; RpS.; coal-stack; W. (T., Cr.); G.; MY. (7), numerous Sdgs.
13·7	MUSLIMIYE (29)	Alt. *c.* 1,575 ft. (*c.* 480 m.). ES. (2 roads); Tbl. (15·5 m.); RpS. (light); W. (T. 6,600 gls.; 2 Cr., SP., well); PL., MY. (5). Junction with line to Fevzipaşa and Adana (Route 9).
		Line turns north-east over open undulating plain 10 km. wide, mostly cultivated. Hills rise about 80 m. above the plain.

Km. from Aleppo	*Stations and passing-loops*	*Remarks*
15	..	Steel and concrete bridge (12 m. + 2 × 19 m.).
43	AKHTERIN (20)	W. (T. 6,600 gls.; Cr., SP.); PL., DES. Village and old fort to south of station.
63	ÇOBANBEY (21)	PL., DES. SYRIAN frontier and customs post. Country becomes more stony and line frequently passes through shallow cuttings or over low embankments.
64	..	Line crosses bridge over tributary of the Kuwaik.
75	..	Steel bridge (21 m.).
84	AĞAÇKOYUNLU (21)	W. (T. 7,000 gls.; Cr., SP.); PL., DES.
86	..	Steel girder and concrete bridge (2 × 9 m.) over Sacir stream. Line is embanked near the stream, but gradually rises 1 in 83 over undulating country between the Sacir stream and the Euphrates.
105	HÜLMEN (14)	PL., DES.
119	KARKAMIŞ (CARABLUS) (3)	ES. (2 roads); Tbl. (19 m.); W. (T. 9,000 gls.; Cr., well); PL., MY. (3). Station on right bank of Euphrates, close to site of Carchemish, an ancient Hittite fortress. Jerablus (*Turk.* Carablus) is on the Syrian side of the boundary.
119·5	..	Carablus (Jerablus) bridge over Euphrates. Length 816 m. (10 × 80 m.); 10 overhead lattice girders. Width 6 m. (railway 5 m.; foot-path 1 m.). Concrete piers faced with stone to bed-plate; foundations of interlocking concrete piles in iron casing (14 m. × 6 m. in plan); top of piles at low-water level. Concrete foundations are 13 m. deep in sandy bed; elsewhere on rock. Right bank is protected by earthen bank on stone-wall foundation (photo. 98).
122	ZORMAĞA (23)	PL.
145	SIFTEK (13)	PL.
158	MÜRSITPINAR (ARAB BUNAR) (21)	Formerly Arappinar. PL. 3 steel and concrete bridges (each 10 m.) at *c.* km. 169, 176, 177.
179	HARAPNUS (KHARAB NAS) (21)	PL.
183	..	Steel and concrete bridge (10 m.).
200	GÜLTEPE (QUL TEPEH) (20)	PL.
212	..	Steel and concrete bridge (10 m.).
213	..	Steel and concrete bridge (4 × 4 m.).
220	AKÇAKALE (TEL ABYADH) (40)	Formerly Tilebyaz. Tbl. (15·5 m.); W. (T. 6,600 gls.; Cr., SP.). PL.
250	..	Steel and concrete bridge (2 × 8 m.).
260	GOCAR (GODJAR) (22)	PL.
282	TÜRM (TUMEN) (22)	Formerly Tevem. PL.



98 *Carablus bridge over the Euphrates, Aleppo–Nusaybin railway*



99. *Fevzipaşa station, junction for Adana, Aleppo, Malatya, and Diyarbekir*



100. *Gök Su viaduct, at km. 146, Fevzipaşa–Diyarbekir railway*

Km. from	*Stations and passing-loops*	*Remarks*
304	TELHAMUT (TEL HAMMUD) (20)	PL.
		There are several bridges over tributaries of the Circip (*Arab.* Khabur) between Telhamut and Resülayn, 3 of which are said to be large (spans 60 m., 40 m., and 40 m.).
324	RESÜLAYN (RAS EL 'AIN) (24)	W. (T. 7,000 gls.; Cr., SP.); PL.
330	..	Bridge (40 m.) over Kartalcircip (*Arab.* Jirjib). There are probably other bridges over tributaries of the Jirjib.
348	BÜYÜK CERELP (14)	PL.
362	ARADA (23)	PL. (*see* p. 257).
385	DERBESIYE (22)	PL. Junction for branch line to Mardin (*c.* 30 km.).
403	..	Bridge (2 × 10 m.).
407	TILHALIF (TEL EL HALIF) (21)	PL. only.
		Four bridges (10 m., 10 m., 2 × 9 m., 2 × 9 m.).
428	SERCIHAN (15)	PL. only.
		2 bridges (2 × 9 m., 5 × 9 m.).
443	NUSAYBIN (12) (*Gaz.*)	PL. Other details not available.
		TURKO-SYRIAN boundary.
455	TEL ZIOUANE (TEL ZOUANE) (18)	PL.
		Numerous bridges over wadis.
473	KUBER EL BID (KOUBOUR EL BID) (24)	PL.
		Bridge over wadi Abbas.
497	DEMIR KAPU (DEMIR KAPOU) (17)	PL.
		Bridges over wadis Knezir and Rumelle.
514	TEL KOCHEK	W. (well); SLP.; ELP.; Sdg. Trains can reverse without entering Iraq. SYRIAN–IRAQ boundary is beyond the station. Line continues to Mosul and Baghdad.

22. FEVZIPAŞA–MALATYA–YOLÇATI–DIYARBEKIR

(*Completed 1935; see page 254*)

Route

Fevzipaşa–Malatya	155·7 miles	250·5 kilometres
Malatya–Yolçati	59·0 ,,	94·9 ,,
Yolçati–Diyarbekir	98·5 ,,	158·6 ,,
	313·2	504·0

Branch line

Yolçati–Elâziz (completed 1934) 14·9 miles; 23·9 kilometres.

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails 79 lb. per yd. (39·5 kg./m.); sleepers, steel and beech. Maximum axle-load, 20 metric tons. Minimum radius of curves, 250 m. Maximum gradient, 1 in 40 in both directions. Maximum distance between stations, 21 km.

Speed and capacity

Overall time (including stops):
Fevzipaşa–Malatya, passenger trains 9 hours; goods trains 10 hours.
Malatya–Diyarbekir, passenger trains 9 hours; goods trains 11 hours.
Capacity of line: 11 trains in each direction in 24 hours.

Miscellaneous

Marshalling yards at Fevzipaşa, Malatya, Diyarbekir; engine-sheds at Fevzipaşa, Gölbaşi, Malatya, Maden, Diyarbekir, where light repairs can be undertaken. In view of the extension of the line beyond Elâziz, additional station facilities may be present at Yolçati or Elâziz.

GENERAL DESCRIPTION

This line is important because it forms the main route to south-east Turkey; alternative to the 'Baghdad railway', it has the advantages of being directly connected to the Central Plateau by Malatya and Sivas, of being entirely within Turkish territory, at some distance from the boundary, and of being State-owned and State-operated. An extension to Iraq, and another from Elâziz to Muş and Persia are already under construction. Some details of these are given in Routes 26 and 27.

The main line was difficult to construct and has over 70 tunnels totalling about 14 km., and more than 1,800 bridges. Details of the most important works are known as far as km. 434 and are given below from the engineers' traces and diagrams. From the same source are abstracted the heights of stations, presumably based on levelling; it is not known whether they are adjusted to a level net.

Fevzipaşa–Malatya. The line leaves Fevzipaşa north-eastwards and follows the trend of the Gâvur Dağ till it reaches the Aksu valley about 19 miles south of Maraş. Here it turns east and follows the Aksu upstream. A good deal of protective engineering is necessary against the Aksu. Between Çelik and Gölbaşi the line crosses more open plateau, but after the latter station it enters a tunnel through the watershed between the Mediterranean and Persian Gulf and emerges in the valley of the Göksu. This river is crossed by a fine viaduct, and the Kapi valley beyond Kumlu (Hamzalar) affords a

passage to Doğanşehir. This is a difficult section; the valley is very narrow and winding, the climb is steep and the curves are sharp; there are 14 tunnels totalling 1·3 miles in 33·5 miles. Beyond the watershed the descent is steep at first and some works are necessary in the Sultan Su valley, but the line keeps fairly level over the broad Malatya plateau in open country for the last 15 miles to Malatya.

Malatya–Diyarbekir. This section of the railway is difficult throughout and there are many fine bridges and a large number of tunnels. The line first descends steeply to the broad valley of the Euphrates, which it crosses at mile 176 (km. 284) by a fine eight-arched viaduct, 384 yards long, linking two high embankments on either side of the river (photos. 107, 108). Normal low water covers three of the main arches, and the river then is about 160 yards wide; normal high water in April or May, when snow is melting in the upper basin, raises the level 23 feet, when the river covers the four main arches and one of the smaller ones, the river being then about 260 yards wide. An abnormally high flood, as in April 1929, may be 13 feet higher, with the river, 380 yards wide, racing through all the arches.

The real difficulties begin, however, on the far side of the Euphrates. The railway makes use of two Euphrates tributaries, the Pinarli and the Kömürhan, climbing the spurs at their sides and tunnelling through their ridges. Beyond Baskil the line makes two hairpin bends doubling twice on its trace and climbing at the maximum gradient of 1 in 40 throughout. The watershed between the Euphrates and the Murat is reached near Şefkat, after which the line descends steeply to beyond Dalan, whence it climbs again to the Gölcük lake, near the source of the Tigris. The gorge of the Tigris is very difficult and a large amount of tunnelling was necessary. Between Dicle, mile 254 (km. 408·7), and the point where the line leaves the Tigris at about mile 267 (km. 430) there are 33 tunnels, totalling 4·2 miles. By Ergani the country is much more open, but details of the engineering works are not known.

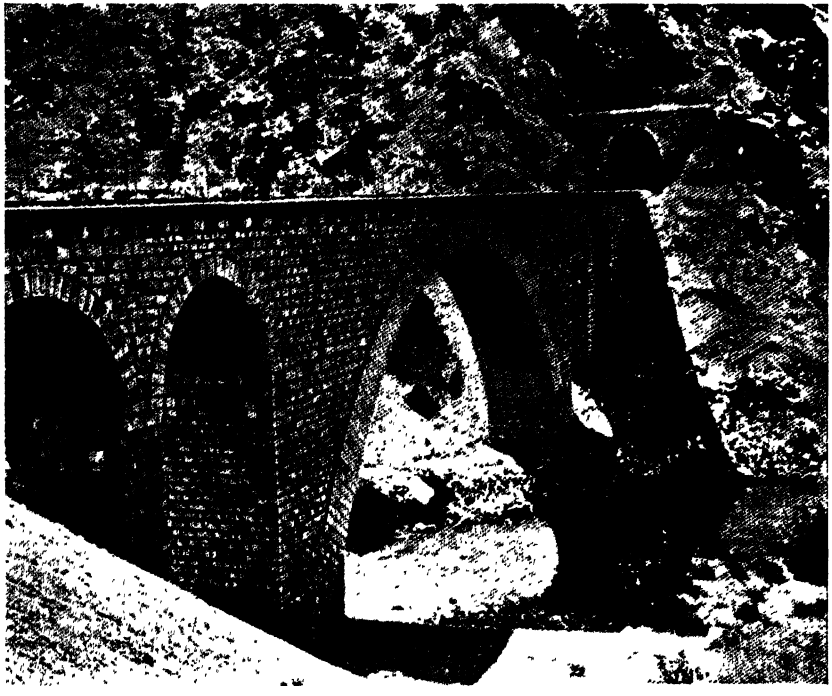
DETAILED DESCRIPTION

Km. from Fevzipaşa	*Stations and passing-loops*	*Remarks*
0·0	FEVZIPAŞA (14	Alt. 1,995 ft. (608 m.). ES. (round-house, 5 roads); Tbl. (20 m.); RpS. (heavy); W. (T. 50,000 gls.; 3 Cr., SP., well); coal-stacks; G.; Wb.; SLP.; ELP.; PL., MY. (5), Sdgs. (3,160 m.). Junction with Adana–Aleppo line (Route 9) (photo. 99).

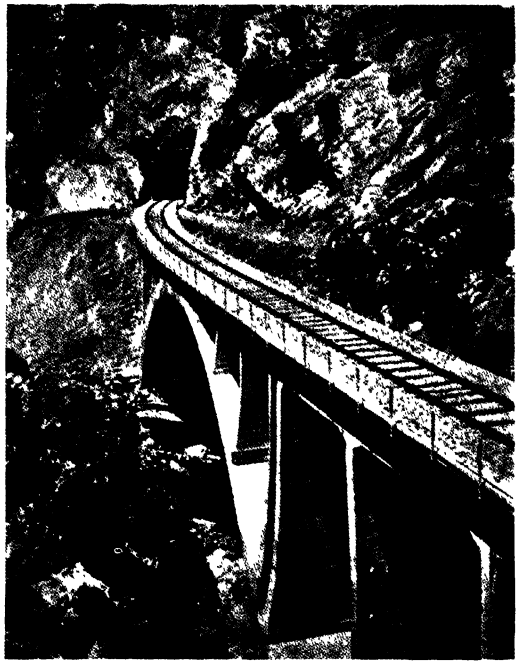
Km. from Fevzipaşa	*Stations and passing-loops*	*Remarks*
		Line keeps west of Emen Gölü and Emirmusa Dağ.
14·0	KÖMÜRLER (15)	Alt. 1,539 ft. (469 m.). G.; PL., LS. (1,374 m.). As line approaches Keçiler it leaves the marshy plain of Gâvurgölü on the east.
28·6	KEÇILER (12)	Alt. 1,535 ft. (468 m.). G.; PL. Line skirts western edge of Gâvurgölü.
40·6	ELOĞLU (13)	Alt. 1,506 ft. (459 m.). W. (T. 13,000 gls.; Cr., SP., well); G.; SLP.; ELP., PL., LS. (1,374 m.). Line turns east.
42·6	..	Lattice-girder bridge (32 m.). Line leads up Aksu valley.
53·3	KÖPRÜAĞZI (15)	Alt. 1,627 ft. (496 m.). G.; PL. Line follows Aksu valley, crossing Maraş–Gaziantep road about km. 66.
58·0	..	Plate-girder bridge (11 m.) over small tributary of Aksu.
68·7	NARLI (18)	Alt. 1,860 ft. (567 m.). PL., LS. (1,374 m.). Line follows Aksu rising through more hilly country with mountains on either side.
86·6	PAZARCIK (19)	Alt. 2,326 ft. (709 m.). W. (T., Cr., SP., well); G.; PL., LS. (1,455 m.). Country becomes more enclosed and Aksu valley narrower. Line keeps close to the river. Ganli Dağ is to east of the line.
91·0	..	Tunnel (111 m.).
104·5	..	Tunnel (216 m.).
106·0	HAYDARLI (17)	Alt. 2,569 ft. (783 m.). W. (T. 13,000 gls.; Cr., SP., well); G.; PL., LS. (1,400 m.). The village is north-east of the station at the foot of the wooded Nurzuk Dağ.
122·6	ÇELIK (15)	Alt. 2,808 ft. (856 m.). PL. Track for LS. disconnected.
137·8	GÖLBAŞI (12)	Alt. 2,845 ft. (867 m.). ES.; Tbl. (20 m.); W. (T. 13,000 gls.; Cr., SP., well); G.; PL., LS., DES. (1,440 m.). Station is opposite the small salt lake, Maden Gölü. Line commences steep climb towards the watershed of the Euphrates, with gradients up to the maximum, and sharp curves.
142·7	..	Tunnel (657 m.).
145·1	..	Tunnel (115 m.).
146·0	..	Line curves sharply to cross the broad river-bed of the Gök Su by a reinforced concrete viaduct, 294 m. long (9 m.+10·5 m.+7×35 m.+10·5 m.+9 m.); greatest height 34 m. (photo. 100). Hill-sides covered with scattered scrub (I, photo. 89, p. 170). Line now follows the upper valley of the Gök Su, known here as the Kapi Dere.



101. *Reinforced concrete bridge over Sürgü Su, at km. 159·3, Fevzipaşa-Diyarbekir railway*



102. *Masonry bridge, at km. 154·3, Fevzipaşa-Diyarbekir railway. Entrance to tunnel 384 m. long at end of bridge*



103. *Reinforced concrete bridge over Sürgü Su, at km. 161·6, Fevzipaşa–Diyarbekir railway. Entrance to tunnel 165 m. long at end of bridge*

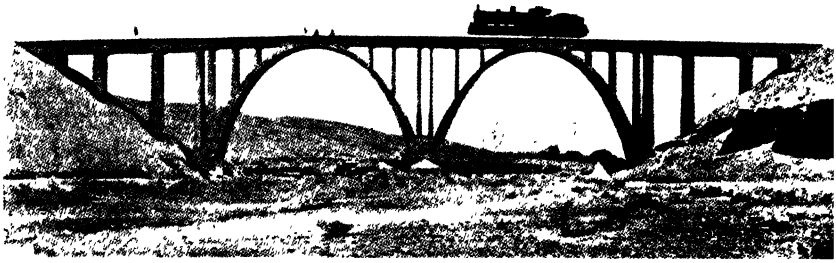


104. *Reinforced concrete bridges at kms. 179·2 and 179·4, Fevzipaşa–Diyarbekir railway*

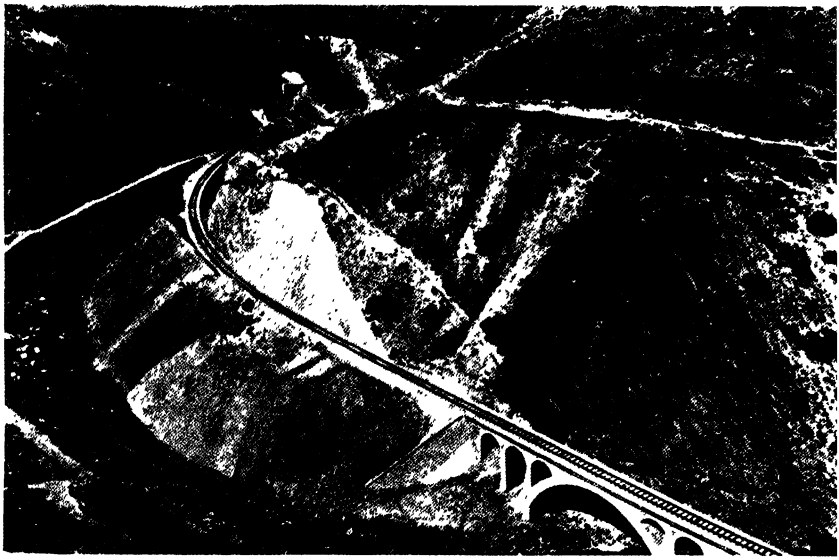
Km. from Fevzipaşa	*Stations and passing-loops*	*Remarks*
149·7	KUMLU (HAMZALAR) (14)	Alt. 2,713 ft. (827 m.). PL. Line continues to climb with steep gradients and sharp curves up the Kapi valley through the wooded Meydan Dağ, with numerous engineering works of all kinds. Only the more important are given below.
154·3	..	Masonry arch, length 81 m. (2×6 m.+30 m.+2×6 m.); height 18 m. (photo. 102).
154·3	..	Tunnel (384 m.).
154·8	..	Tunnel (109 m.).
155·4	..	Masonry arch (25 m.); solid side bays; length 56·25 m.; height 15 m.
155·6	..	Tunnel (349 m.).
156·1	..	Steel lattice-girder bridge (40 m.).
156·2	..	Tunnel (64 m.). Hill-side above line is rocky, with scattered bushes.
156·5	..	Concrete girder bridge (2×5 m.), with masonry revetment against Sürgü Su.
156·6	..	Tunnel (25 m.).
158·2	..	Tunnel (84 m.).
159·1	..	Reinforced concrete arch (30 m.), with concrete girder side-spans; length 71 m.
159·3	..	Reinforced concrete arch over Sürgü Su (25 m.); several concrete girder side-spans; length 66 m.; height 12 m. (photo. 101).
160·8	..	Tunnel (166 m.).
161·6	..	Reinforced concrete arch over Sürgü Su (35 m.), several concrete girder side-spans; length 85 m.; height 15 m. (photo. 103).
161·7	..	Tunnel (165 m.).
162·2	..	Tunnel (30 m.).
164·0	KAPIDERE (19)	Alt. 3,291 ft. (1,003 m.). W. (T. 13,000 gls.; Cr., SP., well); G.; ELP.; PL., LS. (1,383 m.). Sometimes called Tahtaköprü. Line continues to rise steeply to the Euphrates watershed with many sharp curves.
165·2	..	Tunnel (163 m.).
167·0	..	Tunnel (336 m.).
168·0	..	Reinforced concrete arch, 30 m.; several concrete girder side-spans; length 83 m.; height 14 m.
174·0	..	Tunnel (84 m.).
174·6	..	Tunnel (85 m.).
178·8	..	Reinforced concrete arch, 25 m.; sides blocked in with concrete; length 49 m.
179·2	..	Reinforced concrete arch, 25 m.; sides as above; length 47 m. (photo. 104).
179·4	..	Reinforced concrete arch, 25 m.; sides as above; length 49 m.
180·1	..	Reinforced concrete arch, 25 m.; sides as above, length 53 m.
182·8	KADILI (11)	Alt. 3,839 ft. (1,170 m.). PL.

Km. from Fevzipaşa	*Stations and passing-loops*	*Remarks*
186·9	..	Tunnel (75 m.).
190·0	..	Euphrates watershed (Göksu–Sultan Su), alt. 4,121 ft. (1,256 m.). Line begins steep descent with maximum gradient.
193·8	DOĞANŞEHIR (VIRANŞEHIR) (15)	Alt. 3,967 ft. (1,209 m.). W. (T. 13,000 gls.; Cr., SP., well); G.; PL., LS. (1,382 m.). There are fewer difficulties during the descent, but there is a group of works as the line joins the Sultan Su, all within 2 km. of each other, where the line is dominated by the Baltan Dağ. Hills are covered with brushwood.
203·0	..	Masonry arch, 15 m. (2×3·5 m.+15 m.+2×3·5 m.); length 40 m.; height 11 m.
203·4	..	Masonry arch, 20 m. (3×3·5 m.+20 m.+3·5 m.); length 48 m.; height 10 m.
203·6	..	Masonry bridge, 3 arches (3×12 m.); length 48 m.
203·8	..	Masonry arch, 25 m. (2×3·5 m.+25 m.+3×3·5 m.); length 75 m.
204·0	..	Tunnel (100 m.).
204·4	..	Masonry arch, 25 m. (4×4·5 m.+25 m.+4×4·5 m.); length 67 m.; height 14 m.
204·5	..	Masonry arch, 25 m. (3×4·5 m.+25 m.+3×4·5 m.); length 71 m. (photo. 106).
208·9	SUÇATI (14)	Alt. 3,225 ft. (983 m.). G.; PL. Gradient eases slightly and country opens out. No works of importance.
223·0	AKÇADAĞ (13)	Alt. 3,104 ft. (946 m.). G.; PL., LS. (1,369 m.). Village is near a small forest.
236·4	ELEMENDIK (14)	Alt. 3,100 ft. (945 m.). PL.
240·7	..	Tunnel (337 m.).
241·2	..	Masonry bridge, 3 arches (3×18 m.); length 71 m. (I, photo. 90, p. 170).[1]
241·7	..	Masonry bridge, 2 arches (8 m.+2×18 m.+8 m.); length 72 m.; height 13 m.
246·0	..	Reinforced concrete girder bridge (8×4 m.); length 32 m.
250·5	MALATYA (14) (*Gaz.*)	Alt. 3,002 ft. (915 m.). ES. (4 roads); Tbl. (20 m.); W. (T. 27,000 gls.; 4 Cr., SP., well); RpS.; G.; Wb.; SLP.; PL., MY. (6), several Sdgs. (3,700 m.) (photo. 112). Junction with line to Çetinkaya (Route 23). Line descends north-east over more open fertile irrigated country, which is a fruit and opium growing district.
264·3	ESKIMALATYA (19)	Alt. 2,438 ft. (743 m.). G.; PL., LS. (862 m.). Line continues descent towards the Euphrates.

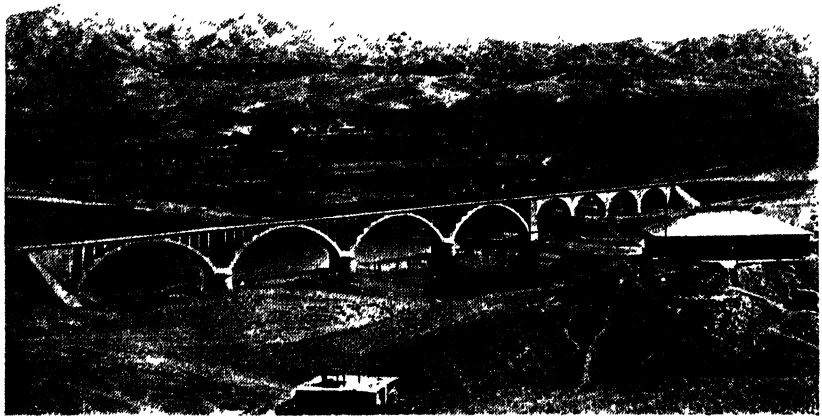
[1] Photograph 90 in vol. I, p. 170 shows the bend in the railway at Beyderesi with the bridge at km. 241·2 in the foreground. The bridge at km. 241·7 is in the distance.



105. *Reinforced concrete viaduct at Çöloğlu, km. 271·4, Fevzipaşa–Diyarbekir railway*



106. *Fevzipaşa–Diyarbekir railway and Sultan Su valley. Masonry bridge at km. 204·5 in foreground; bridge at km. 204·4 on curve; exit from tunnel, 100 m. long, at km. 204·0 in distance*



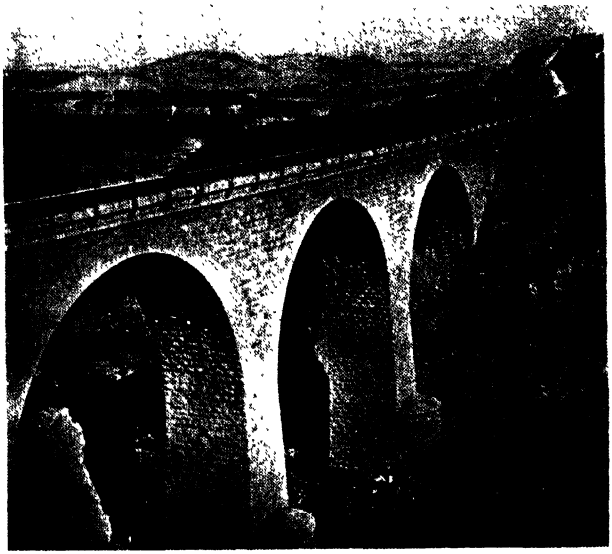


107, 108. *Euphrates viaduct, 351 m. long, at km. 284, Fevzipaşa–Diyarbekir railway. View towards Diyarbekir at the low-water season*

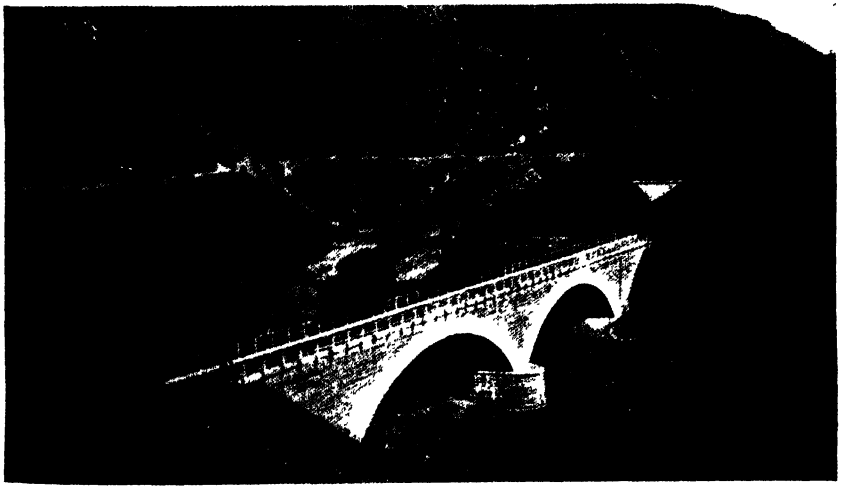
Km. from Fevzipaşa	*Stations and passing-loops*	*Remarks*
271·4	..	Reinforced concrete viaduct at Çöloğlu, 2 main arches, girder side spans (4 m.+7 m.+4 m.+ 2×26 m.+5 m.+7 m.+4 m.); length 110 m.; height from river-bed, 19 m. (photo. 105).
283·1	FIRAT (11)	Alt. 2,067 ft. (630 m.). W. (T. 13,000 gls.; Cr., SP., well); PL., LS., DES. (1,075 m.).
284·1	..	Reinforced concrete viaduct over Euphrates, 4 main arches (4×55 m.+4×25 m.); length 351 m. (photos. 107, 108).
		Line crosses the valley towards opposite hills, climbing steeply.
294·0	BEKIRHÜSEYIN (10)	Alt. 2,595 ft. (791 m.). G.; PL., LS. (852 m.).
		Line cuts through a spur and winds up the hill-side enclosing a tributary (Pinarli Çay) of the Euphrates. It rounds the head of the Pinarli Çay and tunnels through the opposite spur. Much tunnelling is necessary.
296·0	..	Tunnel (87 m.).
296·8	..	Tunnel (235 m.).
300·5	..	Tunnel (292 m.).
301·1	..	Tunnel (142 m.).
304·2	PINARLI (15)	Alt. 3,097 ft. (944 m.). PL., LS.
		Ascent continues with maximum gradient, climbing the spur at the side of the Kömürhan Su, a large tributary of the Euphrates.
304·3	..	Tunnel (74 m.).
307·0	..	Tunnel (128 m.).
309·0	..	Tunnel (128 m.).
310·0	..	Tunnel (169 m.).
310·4	..	Tunnel (192 m.).
311·0	..	Tunnel (118 m.).
315·9	..	Masonry bridge (7×10 m.); length 94 m.
317·2	..	Masonry bridge (6×10 m.); length 82 m.; height 14 m.
319·0	BASKIL (13)	Alt. 3,864 ft. (1,175 m.). W. (T. 13,000 gls.; Cr., SP., well); G.; PL., LS. (862 m.).
		Ascent continues with maximum gradient.
		Line makes two hairpin bends after Baskil, swinging first west-south-west, then east-north-east, to Şefkat, at the head of the Kömürhan Su.
322·4	..	Bridge (4×8 m.).
322·6	..	Bridge (4×8 m.).
331·6	ŞEFKAT (14)	Alt. 4,543 ft. (1,382 m.). G.; PL., LS. (862 m.). Station is close to the watershed between Euphrates and its large tributary, the Murat.
332·0	..	Tunnel (666 m.) through the watershed. The highest point of the whole line, 4,596 ft. (1,398 m.), is in this tunnel. Steep descent begins soon afterwards.
335·8	..	Masonry bridge, 3 arches (3×15 m.); length 74 m.; height 19 m. (photo. 109).

Km. from Fevzipaşa	*Stations and passing-loops*	*Remarks*
345·4	YOLÇATI-(11)	Alt. 3,934 ft. (1,199 m.). Tbl. (20 m.). W. (13,000 gls.; Cr., SP., well); G.; Wb.; PL., 2 LS. (1,341 m.). Junction with branch (23·9 km.) to Elâziz (*Gaz.*). Tbl.; 2 LS. (2,080 m.). The line is now being extended beyond Elâziz. *See below*, Route 27.
		Main line winds east-south-east downwards over undulating plateau country to the head of the Uluova, which it reaches about km. 354.
356·2	DALAN (9)	Alt. 3,370 ft. (1,027 m.). PL., LS.
360·3	..	Masonry bridge (4 × 10 m.) over Uluova stream; length 63 m.
365·0	SIVRICE (12)	Alt. 3,291 ft. (1,003 m.). G.; PL., LS. (868 m.). Line ascends to cross into basin of Lake Gölcük.
366·0	..	Masonry bridge (4 × 10 m.).
371·5	..	Tunnel (344 m.).
375·1	..	Tunnel (601 m.).
		Line reaches western edge of Gölcük, a salt lake at alt. 4,020 ft. (1,225 m.), 23 km. long, shallow at edges but 80 m. deep in middle.
377·0	KÜRK (12)	Alt. 4,055 ft. (1,236 m.). W. (T. 13,000 gls.; Cr., SP., well); G.; PL., LS. (850 m.). Station by western end of Gölcük.
		Line crosses several small streams feeding the lake, and keeps close to the southern shore.[1] The bridges are all of the same reinforced concrete girder type.
377·4	..	Bridge (2 × 8 m.).
377·6	..	Bridge (4 × 8 m.).
378·2	..	Bridge (2 × 8 m.).
378·5	..	Bridge (3 × 8 m.).
384·0	..	Tunnel (91 m.).
388·9	GÖLCÜK (13)	Alt. 4,036 ft. (1,230 m.). PL. Station and line close to southern shore of lake.
		Line continues to follow this shore to km. 400 (I, photo. 101, p. 185).
401·4	GEZIN (7)	Alt. 4,026 ft. (1,227 m.). G.; PL., LS. (900 m.). Line almost immediately joins the Tigris (Dicle).
402·0	..	Concrete girder bridge (2 × 8 m.).
407·2	..	Masonry bridge (2 × 8 m.).
407·9	..	Tunnel (97 m.).
408·7	DICLE (13)	Alt. 3,901 ft. (1,189 m.). G.; SLP.; PL., LS. (862 m.).
		The head valley of the Tigris is enclosed and very difficult. An immense amount of tunnelling has been necessary throughout. The line keeps above the left bank of the river.

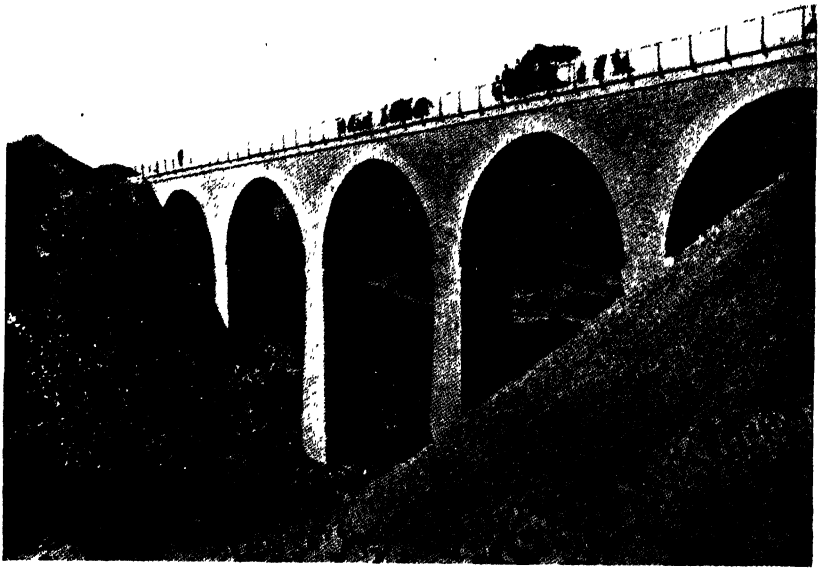
[1] Owing to the fact that several different alinements of the railway were studied, some maps do not show the line correctly. The above description is taken from an official survey of the completed line.



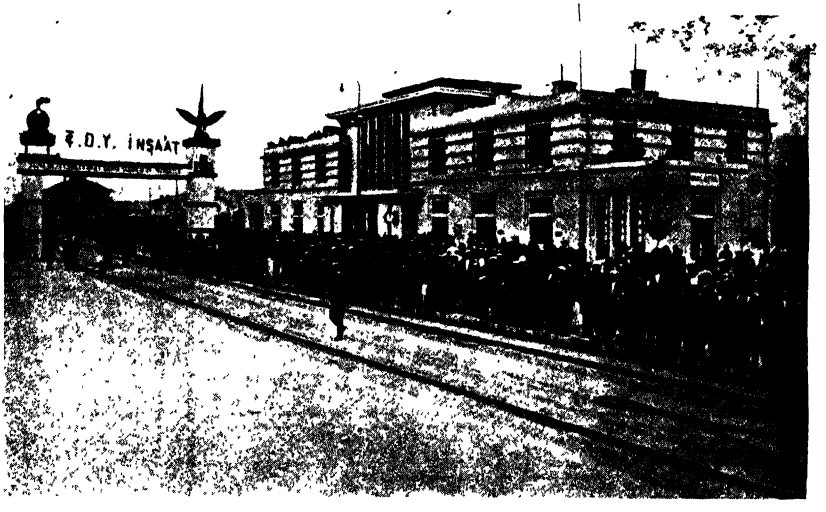
109. *Masonry bridge between Şefkat and Yolçati, at km. 335·8, Fevzipaşa–Diyarbekir railway*



110. *Masonry bridge over the upper Tigris, at km. 417·5 from Fevzipaşa and about 4 km. from Erganimadeni. Entrance to tunnel 104 m. long, in shadow beyond bridge. Fevzipaşa–Diyarbekir railway*



111. *Masonry viaduct over the Komaik Su, at km. 432 from Fevzipaşa and about 6 km. from Sallar. Fevzipaşa–Diyarbekir railway*



112. *Malatya Railway Station*

Km. from Fevzipaşa	*Stations and passing-loops*	*Remarks*
409·5	..	Tunnel (463 m.).
409·9	..	Tunnel (78 m.).
410·1	..	Tunnel (270 m.).
410·4	..	Tunnel (261 m.).
410·7	..	Tunnel (156 m.).
411·2	..	Tunnel (99 m.).
412·8	..	Tunnel (226 m.).
413·2	..	Tunnel (328 m.).
414·0	..	Tunnel (180 m.).
415·1	..	Tunnel (443 m.).
415·6	..	Masonry bridge, 3 arches (3 × 10 m.).
415·7	..	Tunnel (58 m.).
415·9	..	Tunnel (118 m.).
417·1	..	Tunnel (270 m.).
417·2	..	Masonry bridge, 2 arches (2 × 30 m.).
417·3	..	Tunnel (104 m.).
417·5	..	Masonry bridge, 2 arches (2 × 30 m.) (photo. 110).
418·3	..	Concrete girder bridge (7 × 8 m.).
418·5	..	Tunnel (243 m.).
419·5	..	Tunnel (218 m.).
420·2	..	Tunnel (389 m.).
421·4	ERGANIMADENI (MADEN) (17) (*Gaz.*)	Alt. 3,146 ft. (959 m.). ES. (2 roads); Tbl. (20 m.); W. (T. 48,000 gls.; 3 Cr., SP., well); RpS. (heavy); G.; Wb.; SLP.; PL., several LS. (2,023 m.). Erganimadeni (formerly Arghana Maden) is an important copper-mining centre; it is now often called Maden, "the Mine" (fig. 25, pp. 120-1). The country remains very difficult for the railway and there are still many engineering works along the valley of the Tigris. Line descends steeply to the Tigris and crosses at km. 427·9. Here the Tigris bends sharply to the east, and the line tunnels through a ridge to Sallar.
421·5	..	Tunnel (67 m.).
421·6	..	Masonry bridge, 2 arches (2 × 30 m.).
422·1	..	Masonry bridge, 2 flat arches and one subsidiary girder span (7·5 m. + 2 × 30 m.); length 115 m.; height 10 m.
422·2	..	Tunnel (432 m.).
422·7	..	Tunnel (113 m.).
422·9	..	Tunnel (22 m.).
424·9	..	Masonry bridge, 2 main arches (2 × 25 m.), and 9 small subsidiary arches; total length 81 m.; height 12 m.
425·2	..	Tunnel (77 m.).
425·3	..	Tunnel (94 m.).
425·6	..	Tunnel (154 m.).
426·5	..	Tunnel (35 m.).
426·6	..	Masonry bridge, 2 main arches (2 × 22·5 m.), and

Km. from Fevzipaşa	*Stations and passing-loops*	*Remarks*
		10 small subsidiary arches; total length 73 m.; height 11 m.
426·6	..	Tunnel (240 m.).
427·9	..	Masonry viaduct, 5 arches (5 × 14 m.); length 99 m.; height 18 m.
428·1	..	Tunnel (404 m.).
429·4	..	Tunnel (49 m.).
429·5	..	Tunnel (138 m.).
431·0	..	Tunnel (85 m.).
432·0	..	Masonry viaduct, 5 arches (5 × 14 m.); length 94 m.; height 24 m. (photo. 111).
432·1	..	Tunnel (154 m.).
433·0	..	Tunnel (157 m.).
434·0	..	Tunnel (645 m.) through watershed.
		Line leaves Tigris basin and crosses to the head basin of the Kizilçibuk stream. Details of engineering works from km. 430 to Diyarbekir are not known.
c. 438	SALLAR (9)	Alt. 3,045 ft. (928 m.). G.; PL., LS. (862 m.).
		Line descends the head stream of the Kizilçibuk south-eastwards.
c. 447	ERGANI (21) (OSMANIYE)	Alt. 2,654 ft. (809 m.). G.; PL., LS. (862 m.).
		The railway now traverses the northern basaltic lavas of the great extinct volcano Karaca Dağ, crossing a watershed into the upper basin of the Karacadağ Suyu which drains the northern slopes of the volcano into the Tigris.
c. 468	GEYIK (19)	Alt. 2,448 ft. (746 m.). W. (T. 13,000 gls.; Cr.); G.; PL., LS. (862 m.).
		At about km. 480 the line crosses the Karacadağ Suyu.
c. 487	LEYLEK (17)	Alt. 2,326 ft. (709 m.). G.; PL., LS. (862 m.).
		After crossing another tributary of the Tigris, the line approaches Diyarbekir from the north-west.
504·0	DIYARBEKIR (*Gaz.*)	Alt. 2,126 ft. (648 m.). ES. (3 roads); Tbl. (20 m.); W. (T. 26,000 gls.; Cr.); G.; Wb.; SLP.; PL., MY., several Sdgs. (3,230 m.).
		The line has now been extended eastwards and construction is continuing. Some details are given below, in Route 26.

23. ÇETINKAYA–MALATYA

(*Completed 1937; see page 253*)

Distance: 86·9 miles, 139·8 kilometres.

Permanent way and stations

Gauge, normal (1,435 mm.). Single track throughout. Rails, 79 lb. per yd. (39·5 kg./m.); sleepers, steel. Maximum axle-load, 20 metric tons.

Minimum radius of curves, 250 m. frequent between Hasançelebi and Yazihan. Maximum gradient, 1 in 55 in both directions. Maximum distance between stations, 26 km. between Yazihan and Dilek.[1]

Speed and capacity

Overall time (including stops), passenger trains about 4½ hours; goods trains 7 hours. Capacity of line, 10 trains each way in 24 hours.

Miscellaneous

Marshalling yards and engine-sheds at Çetinkaya and Malatya, where light repairs are undertaken.

GENERAL DESCRIPTION

This line forms an important link between the plateau trunk line (Ankara–Sivas–Erzurum) and the southern main line (Fevzipaşa–Malatya–Diyarbekir). It crosses the Kepez Dağ on leaving Çetinkaya and follows the Davulgan tributary of the Euphrates as far as Sarsap, with a steady downward gradient of about 1 in 55/65 almost the whole way. At Sarsap it turns south, and climbing over low foothills crosses the Tohma river by a girder bridge, finally ascending a tributary with a steady gradient of 1 in 55.

Few details of the engineering works are available, but they include 7 girder bridges of about 40-metre span, and 3 double-span girder bridges, 1 of 2×32 m. over the Tohma river; there are also 13 tunnels totalling about 3 km.

DETAILED DESCRIPTION

Km. from Çetinkaya	*Stations and passing-loops*	*Remarks*
0·0	ÇETINKAYA (16)	Alt. 4,639 ft. (1,414 m.). ES. (2 roads); Tbl.; W. (T., Cr.); G.; Wb.; PL., MY. (4), several Sdgs. (3,400 m.). Junction with Routes 6 (Sivas) and 7 (Erzurum). Line runs south-east across the Kangal river into the Kepez Dağ.
16·1	KAYAPINAR (DEMIRIZ) (14)	Alt. 4,908 ft. (1,496 m.). G.; PL., LS. (1,374 m.). Line crosses into the head of the Davulgan valley.
30·3	AKGEDIK (15)	Alt. 4,846 ft. (1,477 m.). W. (Cr.); G.; PL., LS. (1,403 m.). Line crosses Sivas–Malatya motor-road, which from here to Yazihan is never far from the line.
45·2	ULUGÜNEY (10)	Alt. 4,104 ft. (1,251 m.). G.; PL., LS. (1,374 m.).

[1] There may be a PL. between them.

Km. from Çetinkaya	*Stations and passing-loops*	*Remarks*
54·9	HASANÇELEBI (15)	Alt. 3,816 ft. (1,163 m.). G.; PL., LS. (1,384 m.). Line winds down the sides of the Davulgan valley.
69·5	HEKIMHAN (14)	Alt. 3,386 ft. (1,032 m.). W. (T., Cr.); G.; PL., LS. (1,374 m.).
83·8	KESIKKÖPRÜ (13)	Alt. 3,064 ft. (934 m.). G.; PL., LS. (1,372 m.).
96·8	SARSAP (10)	Alt. 2,280 ft. (695 m.). PL. (1,053 m.). Line begins to leave the Kuru (Davulgan) valley and climbs over the foothills into the plain of the Tohma river.
106·5	YAZIHAN (26)	Alt. 2,628 ft. (801 m.). W. (T., Cr.); G.; PL., LS. (1,375 m.).
c. 125	..	Line crosses the Tohma river by a double lattice-girder bridge (2 × 32 m.); length 74 m.
132·8	DILEK (7)	Alt. 2,464 ft. (751 m.). G.; PL., LS. (1,375 m.). This station is sometimes shown as Tilek. Line climbs steadily by a tributary valley of the Tohma.
139·8	MALATYA (*Gaz.*)	Alt. 3,002 ft. (915 m.). ES. (4 roads); Tbl. (20 m.); W. (T. 27,000 gls.; 4 Cr., SP., well); RpS.; G.; Wb.; SLP.; PL., MY. (6), several Sdgs. (3,700 m.) (photo. 112). Junction with line Fevzi-paşa–Diyarbekir (Route 22).

24. ERZURUM–SARIKAMIŞ

(*Completed 1916; see page 249*)

Distance: 108·1 miles, 174 kilometres.[1]

Permanent way and stations

Gauge, 2 ft. 5½ in. (750 mm.). Single track throughout. Rails, no details available; sleepers, wooden. Maximum axle-load, 12·5 metric tons. Minimum radius of curves, 55 m. Maximum gradient, 1 in 33. Maximum distance between stations, 16 km.

Speed and capacity

Overall time (including stops), mixed trains, 13 hours. Capacity of line, 8 trains each way in 24 hours.

Miscellaneous

Marshalling yards and engine-sheds at Erzurum and Sarikamiş. Locomotive repair shops at Erzurum.

[1] The actual length of the line as taken over was 233 km., but 59 km. are west of Erzurum, and have probably been superseded by the new normal-gauge line.

GENERAL DESCRIPTION

This narrow-gauge line was built by the Russians during the War of 1914–18. Being of different gauge to the line westwards from Erzurum and the broad-gauge Russian line from Sarikamiş eastwards, it forms a bottle-neck to through communications. Its conversion to normal gauge has long been contemplated, but according to latest information (1941) no work has yet been started.

On leaving Erzurum it crosses the watershed between the Euphrates and the Aras, and follows the Pasinler plain and the course of the Aras as far as Çiftlik. Here it turns sharply to the north in order to pass round the Suphan Dağ. It turns east again at Yeniköy and passes between the wooded Yağmurlu Dağ and Çiplak Dağ to Sarikamiş.

The country passed through is sometimes difficult, and maps show a number of bridges over streams. Details of these and of station facilities are not available. The list of stations given below contains a few not shown in the official railway distance tables; these (in brackets) may now be out of general use. Kukurt, which is shown in the distance tables, is believed to be connected only by road, and has been omitted.

LIST OF STATIONS

Km. from Erzurum	*Stations and passing-loops*	*Km. from Erzurum*	*Stations and passing-loops*
0·0	ERZURUM (14) (*Gaz.*)	110·2	HIDIRILYAS (10)
9·2	(*Deveboynu*)	115·1	(*Taşkeseri*)
13·9	SIVIŞLI (9)	119·9	ZIVIN (5)
18·0	(*Hamamli*)	125·1	KARAURGAN (6)
22·8	UZUNAHMET (9)	*c.* 131	EBÜLBART (4)
31·8	AKÇALAR (15)	135·1	YENIKÖY (9)
c. 47	HASANKALE (16)	*c.* 144	ISKENDERÇAYI (4)
c. 52	(*Danişment*)	*c.* 148	CELÂLIYE (4)
63·1	KÖPRÜKÖY (9)	*c.* 152	YAZILITAŞ (5)
71·8	HOPIK (8)	156·7	HANDERE (3)
80·0	AZAP (10)	160·4	PRAVALTI (14)
89·6	HORASAN (11)	167·8	(*Pompali*)
100·8	ÇIFTLIK (9)	174·0	SARIKAMIŞ (*Gaz.*)

25. SARIKAMIŞ–LENINAKAN

(*Completed 1899; see page 249*)

Distance: 76·4 miles, 123 kilometres (to U.S.S.R. boundary).

Permanent way and stations

Gauge, broad (5 ft.; 1,524 mm.). Single track throughout. Rails, 62 lb. per yd. (31 kg./m.); sleepers, wooden. Maximum axle-load, 16·5 metric

tons. Minimum radius of curves, 267 metres. Maximum gradient, 1 in 60. Maximum distance between stations, 16 km.

Speed and capacity

Overall time (including stops), mixed trains, 4 hours. Capacity of line, 12 trains each way in 24 hours.

Miscellaneous

Marshalling yards and engine-sheds probably at Sarikamiş and Kars. Locomotive repair shops probably at Sarikamiş. All these facilities are found also at Leninakan in U.S.S.R. territory.

GENERAL DESCRIPTION

This branch of the Russian Tiflis–Julfa railway follows the valley of the Kars river to Kars, keeping north of the Ala Dağ, Porluk Dağ, and Alaca Dağ. At Kars the railway diverges from the river and takes a more easterly route. The boundary is crossed about 10·5 km. beyond Kizilçakçak.

A number of bridges crossed by the line are shown on maps, but details of them are not available. The two most important are probably those over the Kars and Arpa rivers at about kms. 54 and 126. The following is a list of stations (those in italics and in brackets are not shown in Turkish distance tables).

Km. from Sarikamiş	*Stations and passing-loops*	*Km. from Sarikamiş*	*Stations and passing-loops*
0·0	SARIKAMIŞ (16) (*Gaz.*)	82·6	(*Yahniler*) (9)
c. 5	(*Yağbasan*)	91·8	BAŞGEDIKLER (9)
15·5	ÇATAK (9)	101·3	KURUDERE (11)
24·3	SELIM (11)	*c.* 106	(*Sahanalar*)
35·0	BENLIAHMET (11)	112·4	KIZILÇAKÇAK (15)
46·1	DIKME (VILADIKARS) (13)	*c.* 123	'HUDUT' (frontier post)
59·3	KARS (14) (*Gaz.*)	*c.* 127	ARPAÇAY (U.S.S.R.) (9)
c. 73	MEZREA (10)	136·0	LENINAKAN (U.S.S.R.)

26. DIYARBEKIR–KURTALAN–CIZRE

(Under construction 1942)

This line is to be the link between Turkish State Railways at Diyarbekir and Iraq. It is completed to km. 85, and the whole line to Kurtalan is expected to be open for traffic by the beginning of 1943. The large masonry bridge over the Garzan is already finished; great

difficulties were experienced in the Kira Dağ between the Batman and Garzan valleys.

Kurtalan is to be an important station, and possibly a junction for Siirt. From here the line is to cross into the Başor (Paşor) valley, which will be followed to the Botan and the Tigris. The latter will present great engineering difficulties, and the section from Kurtalan to Cizre will require about 6 miles of tunnelling. Several large Tigris tributaries will have to be bridged, one bridge over the Khabur being about 500 yards long. The most difficult sections are said to be between Kurtalan and km. 175, and between kms. 229 and 269.

The details given below are compiled from reports of constructional progress and may be unreliable.

Section of construction	*Km. from Diyarbekir*	*Station*	*Remarks*
I. Km. 1 to km. 20	0·0	DIYARBEKIR (*Gaz.*)	*See* Route 22.
	8·3	..	Steel girder bridge over the Tigris (2×8 m.+2×60 m.+4×8 m.). Line follows Tigris valley downstream.
	c. 15	[MUDERIS?]	..
II. Km. 20 to km. 42	*c.* 30	[HOLAN?]	..
	36·5	..	Steel girder bridge over the Anbar tributary of the Tigris (4×60 m.).
	39·6	..	Steel girder bridge over the Kuru tributary of the Tigris (60 m.+2×8 m.).
III. Km. 42 to km. 60	47·4	ULAM (BISMIL)	..
	51·8	..	Steel girder bridge over the Pamuk tributary of the Tigris (3×60 m.).
IV. Km. 60 to km. 85	*c.* 61	ÇOLTEPE	About 28 small bridges and culverts in this section.
	c. 68	..	Reinforced concrete bridge over the Salat tributary of the Tigris (8×32 m.).
	c. 79	..	Beyond Sinan, reinforced concrete bridge over the Batman tributary of the Tigris (10×44 m.). Line turns north out of the Tigris valley up the Batman valley, climbing the flank of the Kira Dağ.
V. Km. 85 to km. 106	?	BATMAN	About 51 small bridges and culverts in this section.
	?	KIRADAĞ	2 major tunnels (290 m. and 330 m.).

Section of construction	*Km. from Diyarbekir*	*Station*	*Remarks*
VI. Km. 106 to km. 131			About 84 small bridges and culverts in this section.
	c. 123	..	Tunnel (103 m.).
			Line crosses Kira Dağ watershed and descends to valley of Garzan.
	?	Beşiri	..
	?	..	Masonry bridge over the Garzan river; main arch span 45 m.; 4–6 approach arches on each side (fig. 57).

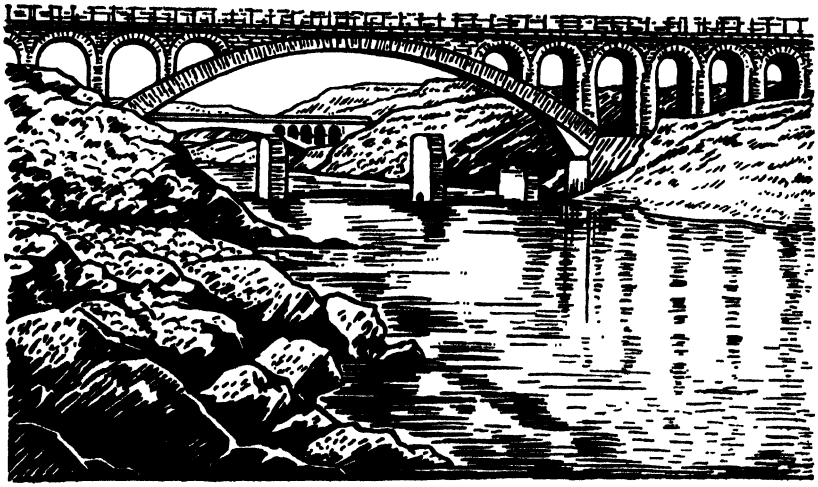


Fig. 57. *Garzan Railway Bridge with Road Bridge behind*

VII. Km. 131 to km. 159	?	Garzan	About 72 small bridges and culverts in this section. Tunnel (140 m.).
	c. 159	Kurtalan	15 buildings at station; Sdgs. and MY. (suggested junction for line to Siirt).
	c. 325	Cizre (*Gaz.*)	From Kurtalan the line is projected to follow the Başor, Botan, and Tigris valleys. No details of the project are available.

27. ELÂZIZ–VAN–PERSIAN FRONTIER

(Under construction 1942)

On leaving Elâziz, at the end of the Yolçati–Elâziz branch of the Malatya–Diyarbekir railway, this new line follows the Harinke stream to the Murat river, which is then crossed and followed upstream to Muş. Work is in progress (June 1942) on the ten sections to Çapakçur, and the line to Palu should be finished by April 1943. The country between Palu and Çapakçur is very difficult in places, and many engineering works are necessary; contracts for the five sections concerned with this stretch were placed in 1941, but work will not be finished until the end of 1943 at the earliest.

The Çapakçur–Tatvan sections have been surveyed. As far as Muş there are many constructional difficulties, but from Muş to Tatvan, at the western end of Lake Van, the alinement over the lava-plains of the Nemrut and Kerkur volcanoes should be easier (see panorama, vol. I, fig. 47, p. 187); no constructional work beyond Çapakçur is yet reported.

Tatvan will be connected with Van town by train ferry. From Van the line will be continued to the Persian frontier and will be joined to the Persian railways by Kotur (Qtur) and Sharifkhane, the terminus of a branch line of the Julfa–Tabriz line.

The details of the lay-out between Elâziz and Çapakçur given below are compiled from constructional proposals and must be treated as unreliable.

Section of Construction	*Km. from Yolçati*	*Station*	*Remarks*
	0·0	YOLÇATI	Branch line of Malatya–Diyarbekir railway (Route 22), completed 1934.
	24·5	ELÂZIZ (*Gaz.*)	
I. Km. 24·5 to km. 46	38·5	HÜGO	Line goes east across fertile Elâziz district to the open valley of the Harinke tributary of the Murat. 84 bridges and culverts, including 2 reinforced concrete bridges (5×8 m.; 3×5 m.) and 1 steel girder bridge (60 m.) over the Harinke stream (?). Maximum gradient, 1 in 83; minimum radius of curves, 500 m.

Section of Construction	*Km. from Yolçati*	*Station*	*Remarks*
II. Km. 46 to km. 55	51·5	ALIŞAM	Line passes through open Harinke valley. 19 small bridges and culverts, the largest being a reinforced concrete bridge (3×4 m.). Maximum gradient, 1 in 70; minimum radius of curves, 2,000 m.
III. Km. 55 to km. 74	69·3	KÜLÜŞKÜR	Line reaches and crosses the Murat. 64 bridges and culverts, mostly with spans of less than 2 m. Steel girder bridge (3×100 m.) over the Murat river at about km. 71. Maximum gradient, 1 in 250; minimum radius of curves, 400 m.
IV. Km. 74 to km. 87	77·2	KARAGEDİK	Line follows north side of Murat valley upstream. 27 bridges and culverts, all of 3 m. or less. 4 tunnels (182 m., 214 m., 280 m., 286 m.). Maximum gradient, 1 in 250; minimum radius of curves, 500 m.
V. Km. 87 to km. 93	92·6	PALU (*Gaz.*)	Line continues up north side of Murat valley. No major works; 9 small bridges. Maximum gradient, 1 in 250; minimum radius of curves, 500 m.
VI. Km. 93 to km. 110	..	..	Details of alinement are not available. The Murat valley becomes very enclosed and difficult. 61 bridges and culverts, mostly less than 2 m., but one reinforced concrete bridge (2×8 m.) and one whose spans will total between 200 and 220 metres. 11 tunnels, the largest 950 m. and 852 m., the rest between 30 m. and 340 m. Maximum gradient, 1 in 250; minimum radius of curves, 400 m.
VII. Km. 110 to km. 131	113·2	HÜN	Details of alinement not available. 78 bridges and culverts, mostly small, but including 2 concrete-girder bridges (each 3×8 m.), a double-arch (2×8 m.), 2 small viaducts (2×10 m.; 10 m.+20 m.+10 m.), and 3 single-arch bridges (3 m., 4 m., 5 m.). 17 tunnels, total length 3,344 m., the longest being 617 m., 710 m., 400 m., 300 m., the rest between 15 m. and 196 m. Maximum gradient, 1 in 250; minimum radius of curves, 400 m.

Section of Construction	*Km. from Yolçati*	*Station*	*Remarks*
VIII. Km. 131 to km. 135	..	..	A small section with 8 bridges and culverts, including a reinforced concrete bridge (2×8 m.) and two tunnels (180 m. and 40 m.). Maximum gradient, 1 in 250; minimum radius of curves, 400 m.
IX. Km. 135 to km. 155	135·7	SUVARAN	65 bridges and culverts, including a double-arch (2×8 m.). 5 tunnels totalling 469 m., the longest being 152 m. Maximum gradient, 1 in 250; minimum radius of curves, 500 m.
X. Km. 155 to km. 168	157·2	BINGÖL (ÇAPAKÇUR) (*Gaz.*)	The Murat valley begins to open out in this section; between it and the Gönik river is the open Çapakçur plain. 35 bridges and culverts, including a double-arch (2×8 m.) and a concrete girder bridge (4×8 m.). Maximum gradient, 1 in 200; minimum radius of curves, 600 m. The line is to be continued by the Murat valley to Muş and then to cross the Nemrut lava plains to Tatvan.

II. ROADS

General Description

EXCEPT in a few of the most important Turkish towns there were no good roads at the founding of the Republic in 1923. All the old highways and many of the fine old bridges, built by the Roman, Byzantine, Seljuk, and Ottoman Empires in their periods of greatness, had already suffered from years of neglect before the wars of 1914–18 and of Independence (1919–23) finally ruined them. The task of the new Turkey was to reconstruct some of the old roads and to make new ones.

Progress has been much less marked than on the railways, and in 1942 the road pattern is far from complete. There are several reasons. A road-construction programme has had to be designed to meet the strategic and economic needs of the new State. In this some of the old roads can be re-made to fit the new pattern, while others cannot. Work was often begun at several points—a sound practice perhaps, in view of the urgency, but one which leads to large gaps until the whole is finished. Much money and effort has been devoted to roads and bridges in the west and near the capital, and those in the eastern and south-eastern vilâyets have had to wait their turn. Good progress has also been made inland of the Black Sea coasts, especially in the west. The concentration of work in Western Anatolia has been due to defence requirements; the backwardness in the east has been caused by physical difficulties and by the more troubled state of the country. Meanwhile maps often show the old roads and the new with the same symbol, though many of the former are still impassable in wet weather.

Road reconstruction is carried out in various stages. Old roads which are required by the new national policy are re-made in their worst sections where they are not duplicated by railways; sometimes they are widened and dangerous bends removed. Unserviceable and old wooden bridges are patched and repaired until they can be replaced by modern ferro-concrete or girder bridges. The blocking of culverts by debris brought down by rain and landslips has been dealt with partly by re-alining them, partly by revetting the hill-sides, and partly by carefully draining water into the culverts in order to flush them. Except on certain roads in the west and in densely populated areas, where asphalt has been used, roads are often only roughly surfaced. In some outlying vilâyets no effort has yet been made to build

all-weather roads, but on many of the reconstructed and new roads inspection and maintenance posts have been set up to house engineers and workmen responsible for the upkeep of particular sections.

By 1938, 86 new major bridges had been completed, and by 1941 this number had increased to 120, with 4 under construction. They are generally of reinforced concrete, sometimes of masonry, exceptionally of steel. Near important towns the bridge roadway is at least 15 ft. 9 in. wide. In the Public Works report of 1941 it is admitted that the war has made it impossible to carry out the plans for new iron and reinforced concrete bridges, owing to the difficulty of obtaining raw materials. Work on bridges already started is continuing, but no new reinforced concrete ones are to be built for the present. New and reconstructed or repaired wooden bridges are to take their place temporarily, so that the needs of the country may be met. A list of these is given on pp. 506–7.

The concrete bridges that have been built follow three main types: plain girder, simple arch, and bowstring suspension.

The plain reinforced concrete girder bridge is used wherever possible, for it is inexpensive and strong. Most narrow rivers with easy, open approaches, with beds suitable for intermediate piers, and where the flood rise is not likely to be obstructed by a low roadway, have bridges of this type, particularly in European Turkey and Western Anatolia.

The simple reinforced concrete arch is mainly used on the upper courses of the large rivers, especially in rocky gorges, and constricted country, where the approaches are high above the river-bed and where a high flood needs ample clearance. Resistance to flood is reduced by an openwork design, made possible by using ferro-concrete spars instead of masonry. With single-span bridges of this type the abutments are generally locked in solid rock. Fine examples are the Ismetpaşa bridge (No. 105; fig. 106)[1] over the Euphrates, with a clear span of 357·6 feet, the Singeç bridge over the Murat Su (No. 117; fig. 117), and the Fadli bridge (No. 37; fig. 85) over the Kelkit Irmak. All these are single-span bridges. Of similar type, but with three spans, is the Göksu bridge (No. 103; fig. 108) on the Adiyaman–Gölbaşi road.

The bowstring suspension is used over the lower courses of the largest rivers, especially in their deltas. Here the roadway is slung

[1] A list of the new bridges built between 1923 and 1941, with their chief characteristics, is given on pages 495–505; but not all of them as yet serve finished roads. The numbers shown after bridges in the text refer to this list; where they are illustrated the figure is also given.

CHAPTER XVI (*cont.*)

II. ROADS

General Description

EXCEPT in a few of the most important Turkish towns there were no good roads at the founding of the Republic in 1923. All the old highways and many of the fine old bridges, built by the Roman, Byzantine, Seljuk, and Ottoman Empires in their periods of greatness, had already suffered from years of neglect before the wars of 1914–18 and of Independence (1919–23) finally ruined them. The task of the new Turkey was to reconstruct some of the old roads and to make new ones.

Progress has been much less marked than on the railways, and in 1942 the road pattern is far from complete. There are several reasons. A road-construction programme has had to be designed to meet the strategic and economic needs of the new State. In this some of the old roads can be re-made to fit the new pattern, while others cannot. Work was often begun at several points—a sound practice perhaps, in view of the urgency, but one which leads to large gaps until the whole is finished. Much money and effort has been devoted to roads and bridges in the west and near the capital, and those in the eastern and south-eastern vilâyets have had to wait their turn. Good progress has also been made inland of the Black Sea coasts, especially in the west. The concentration of work in Western Anatolia has been due to defence requirements; the backwardness in the east has been caused by physical difficulties and by the more troubled state of the country. Meanwhile maps often show the old roads and the new with the same symbol, though many of the former are still impassable in wet weather.

Road reconstruction is carried out in various stages. Old roads which are required by the new national policy are re-made in their worst sections where they are not duplicated by railways; sometimes they are widened and dangerous bends removed. Unserviceable and old wooden bridges are patched and repaired until they can be replaced by modern ferro-concrete or girder bridges. The blocking of culverts by debris brought down by rain and landslips has been dealt with partly by re-alining them, partly by revetting the hill-sides, and partly by carefully draining water into the culverts in order to flush them. Except on certain roads in the west and in densely populated areas, where asphalt has been used, roads are often only roughly surfaced. In some outlying vilâyets no effort has yet been made to build

all-weather roads, but on many of the reconstructed and new roads inspection and maintenance posts have been set up to house engineers and workmen responsible for the upkeep of particular sections.

By 1938, 86 new major bridges had been completed, and by 1941 this number had increased to 120, with 4 under construction. They are generally of reinforced concrete, sometimes of masonry, exceptionally of steel. Near important towns the bridge roadway is at least 15 ft. 9 in. wide. In the Public Works report of 1941 it is admitted that the war has made it impossible to carry out the plans for new iron and reinforced concrete bridges, owing to the difficulty of obtaining raw materials. Work on bridges already started is continuing, but no new reinforced concrete ones are to be built for the present. New and reconstructed or repaired wooden bridges are to take their place temporarily, so that the needs of the country may be met. A list of these is given on pp. 506–7.

The concrete bridges that have been built follow three main types: plain girder, simple arch, and bowstring suspension.

The plain reinforced concrete girder bridge is used wherever possible, for it is inexpensive and strong. Most narrow rivers with easy, open approaches, with beds suitable for intermediate piers, and where the flood rise is not likely to be obstructed by a low roadway, have bridges of this type, particularly in European Turkey and Western Anatolia.

The simple reinforced concrete arch is mainly used on the upper courses of the large rivers, especially in rocky gorges, and constricted country, where the approaches are high above the river-bed and where a high flood needs ample clearance. Resistance to flood is reduced by an openwork design, made possible by using ferro-concrete spars instead of masonry. With single-span bridges of this type the abutments are generally locked in solid rock. Fine examples are the Ismetpaşa bridge (No. 105; fig. 106)[1] over the Euphrates, with a clear span of 357·6 feet, the Singeç bridge over the Murat Su (No. 117; fig. 117), and the Fadli bridge (No. 37; fig. 85) over the Kelkit Irmak. All these are single-span bridges. Of similar type, but with three spans, is the Göksu bridge (No. 103; fig. 108) on the Adiyaman–Gölbaşi road.

The bowstring suspension is used over the lower courses of the largest rivers, especially in their deltas. Here the roadway is slung

[1] A list of the new bridges built between 1923 and 1941, with their chief characteristics, is given on pages 495–505; but not all of them as yet serve finished roads. The numbers shown after bridges in the text refer to this list; where they are illustrated the figure is also given.

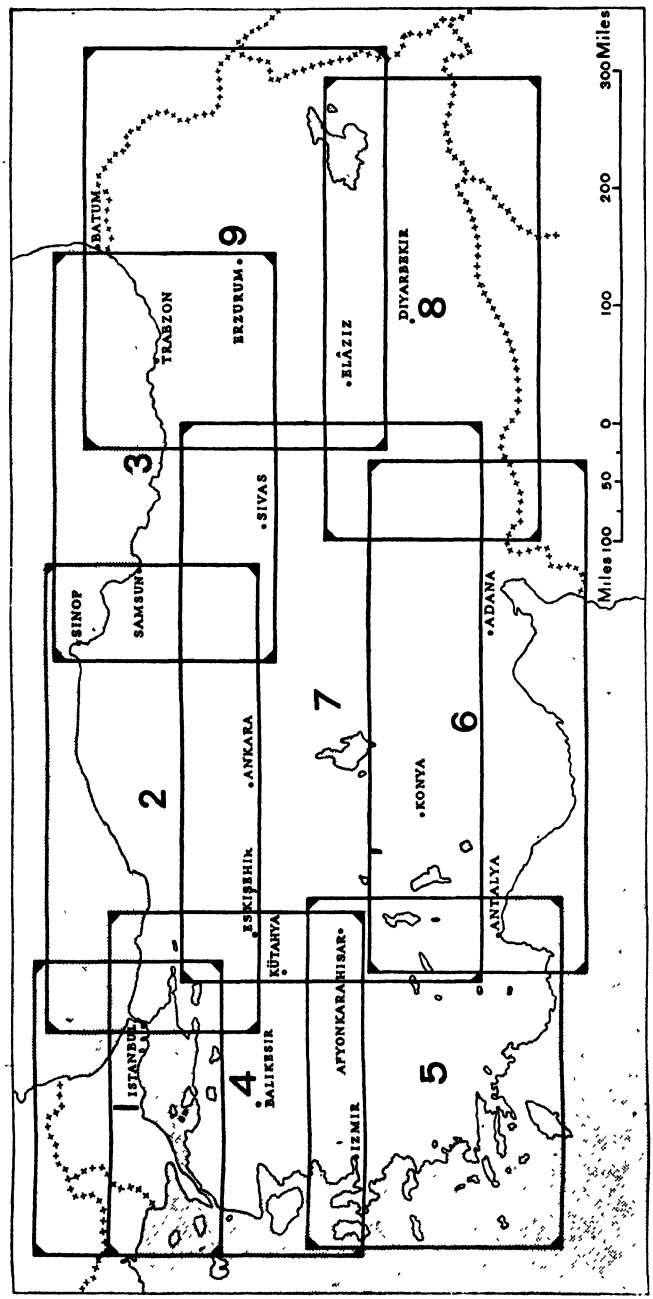


FIG. 58. *Key to Road Maps*: 1. Fig. 60, p. 371; 2. Fig. 66, p. 380; 3. Fig. 76, p. 394; 4. Fig. 89, p. 413; 5. Fig. 95, p. 429; 6. Fig. 97, p. 437; 7. Fig. 104, p. 453; 8. Fig. 105, p. 461; 9. Fig. 113, p. 479.

under the reinforced arch, instead of being carried on it. The type is extremely useful where the river-bed is of alluvium or shifting sand, for the piers carry the weight with little lateral thrust, and provided they are well constructed on rock or pile-driven foundations, the bridge withstands the heaviest loads. They are expensive to build, but rather because of the delta country where they are used than because of their design. The finest example is the great Bafra bridge (No. 27; fig. 79) over the Kizil Irmak on the Sinop–Samsun coast-road. This has no fewer than seven bowstring spans and a total length



FIG. 59. *Old bridge near Sivas*

of over 260 yards; it took two years to build and cost £T221,000. Other fine examples are the Menemen bridge (No. 63; fig. 94) with five spans over the Gediz river, the Dalaman bridge (No. 74; fig. 96) with three spans over the Dalaman, and the Sakarya (No. 14; fig. 78), 2½ miles east of Adapazari, also with three spans. All these are very strongly built.

There are occasional new bridges of other types; up to 1938 there was only one steel cable suspension bridge, that over the Euphrates at Kemah west of Erzincan, a rather frail structure with only a timber roadway.

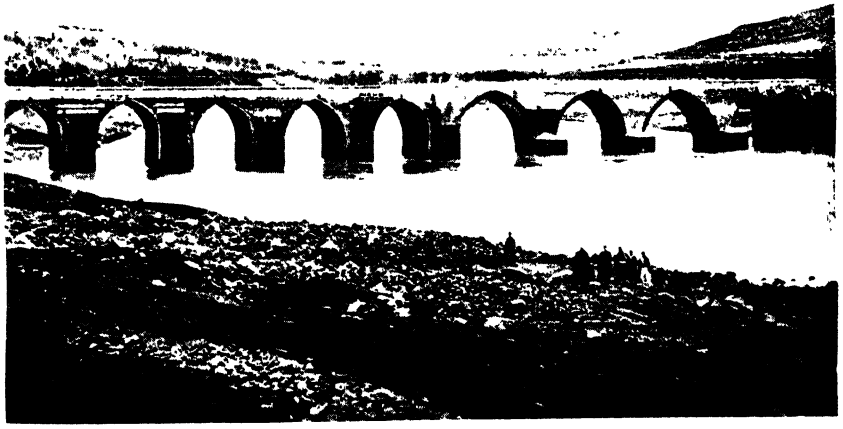
Some of the ancient bridges dating back to Byzantine or early Ottoman times are still available for use and have been repaired. They are usually of solid masonry, with arches springing direct from massive foundations. The roadway is sometimes narrow, but some of them are capable of taking heavy traffic. Fine examples of old masonry bridges still in use are the Seyhan bridge at Adana (fig. 100), the Kizil Irmak bridge near Sivas (fig. 59), the Meriç (Maritsa) bridge

at Edirne (fig. 62), the Batman bridge between Diyarbekir and Siirt (photo. 113), and the Görmeli bridge on the Ermenek–Anamur road in the Taurus (fig. 98). A common type of old bridge in some parts has stone abutments and piers with timber superstructure (fig. 69). Much of the timber was rotten in 1923, but the stonework was fairly sound and efforts have been made to replace the superstructure. Such repaired bridges should be safe for light-motor traffic, but they would not survive a constant stream of heavy vehicles. There are also some iron girder, and a few steel, bridges of various types; but they are much more common on the railways than on the roads. In the past all bridges have suffered from lack of maintenance, and timber-work still tends to be neglected. Light timber-bridges are designed only for local carts, and may require temporary repair before crossing. Foot-bridges and pack-bridges are rarely found except in parts of Kurdistan, Armenia, and Lazistan, where some of the old masonry bridges have steep ascents on either side; in Kurdistan some of the lighter structures are washed away almost annually. Pack-animals usually rely on fords, and such traffic may be held up by swollen streams. There are a certain number of ferries, for cars and carts, particularly on the rivers of the west, on the Euphrates and the Seyhan. Some are operated by State authorities. In certain outlying districts the villagers use ferry-rafts of inflated skins (*keleks*) (photo. 115).

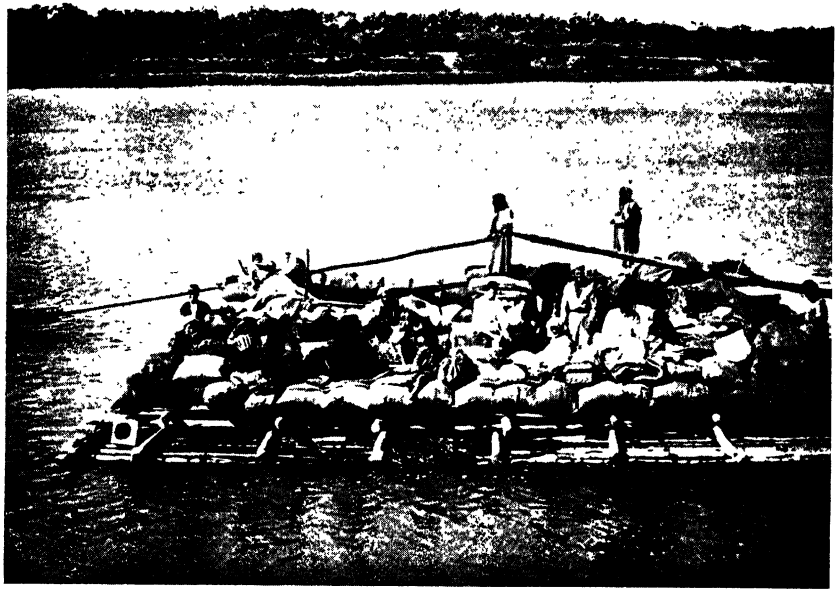
A new and comprehensive programme of trunk-road construction was started in 1939, by which 20,000 miles of roads were to be built in 10 years at a cost of £T120 millions. Turkey is a large country but poor financially. To design and build a new road-net takes time and money. There is no large motoring public to tax for the upkeep of roads. The larger part of the small road-tax is left to the vilâyets for the repair and maintenance of their local roads and minor bridges, and fines are imposed on owners of private cars, buses, and lorries who damage the roads by overloading their vehicles. The more main roads that are built the greater the cost of their upkeep, and the less money is available for new construction. The pattern and design of roads have therefore to be fitted economically to the country's needs. Very few roads will yet bear comparison with those of western Europe. A good first-class road in Turkey has a metalled surface fit for two, and exceptionally three, lines of medium-weight motor-traffic, with bridges said to be capable of taking loads up to about 18 tons; few of these roads would bear the strain of continuous heavy traffic in all weathers, for which they were not designed. All transport is subject to the control of a special department.



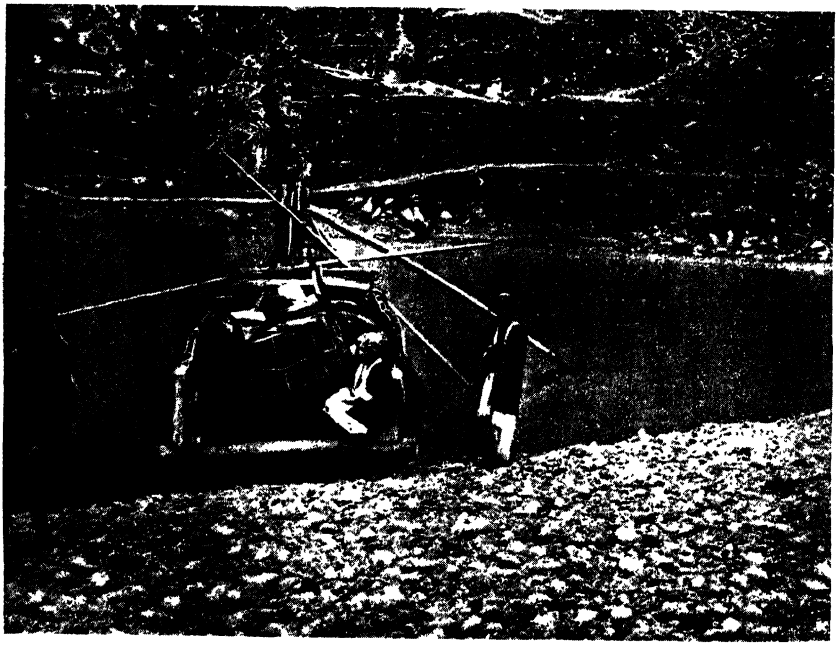
113. *Old Batman bridge, 14 miles east of Silvan*



114. *Tigris bridge below Diyarbekir. The city walls on rising ground behind*



115. *Raft (kelek) on the Tigris*



116. *Euphrates ferry near Kizilin*

Roads, even the national highways, are always subsidiary to railways, and do not compete with them. In several instances old roads taking the same alinements as railways have not been re-made, or have only been repaired in their worst sections. A traveller in Turkey not uncommonly takes his car with him part of the way by train. In the general description which follows, an attempt is made to describe the road pattern and the sea and rail connexions. Distances, in the absence of accurate information, are only approximate, and are given solely as a guide to position in the general road-pattern. Where possible the actual condition of the road-surface at the time of writing has been noted, but the statement that a particular road is in good condition is no guarantee that it will be passable for motor-traffic the next year. In Turkey a persistent struggle has to be waged against weather and physical features, and while it is possible to travel almost anywhere in summer, during the rest of the year snow, rain, and floods frequently interrupt road transport. A feature of road travel in Turkey has for long been the use of side-tracks and alternative routes. These are the natural result of traffic trying to avoid the mud on the road after rain and its dust in dry weather. A settled habit such as this dies hard, and often where the ground is favourable these side-tracks are still used in preference to the made-up road (*Turk.* şose, from *Fr.* 'chaussée').

Besides the road-net there are numerous other lines of lesser communications throughout the country. They may be classed as carriage- and cart-roads, mule and camel caravan tracks, bridle-paths, and tracks only fit for human porters; these also are not dealt with here.

Before 1923, when the motor-car began to come into use, pack-animals were the chief means of transport in Turkey. Ponies and horses, closely followed by camels, were the most numerous; some donkeys were used, but the native donkey is small, and large mules were imported from Cyprus. Oxen and buffaloes were used for drawing carts. Transport along the road from Persia to Trabzon was formerly effected almost entirely by camels, owned by Persian tribesmen. The journey from Tabriz took from three to six months, and the camels went through deep snow on the Zigana pass in winter. Very few camels are to be seen on that road to-day, for they have gradually been replaced by motors during the last ten years. Camels were seen in Edirne in 1909, but probably they have now disappeared in European Turkey. They are still used in the Mersin district and the Taurus mountains, and generally in south-east Turkey and the Central Plateau.

Oxen and buffaloes are the chief draught animals, and are harnessed

to the *araba*, a country cart which usually has four wheels; the old *cağni*, with two solid wooden wheels which are sometimes fitted with an iron tyre, is even more prehistoric in appearance, and is still in use, though now prohibited from entering the towns (I, pp. 366–7).

But with the improvement of roads has gone an increase in the use of motors, and these are to be seen side by side with the more primitive means of transport throughout Turkey. The chief makes are Ford, Dodge, and Chevrolet, imported mainly through Istanbul, where the Ford Company has an assembly plant in Galata. The total of motor vehicles in Turkey in 1941 was estimated at 7,500 lorries, 4,600 touring cars, 2,000 motor cycles, and 750 buses. Of these, possibly not more than half would stand up to continuous hard work, because of repair difficulties. The Standard Oil Company of America supplies most of the oil, but some comes from the Russian Naphtha Syndicate, Steaua Romana, and the Shell Company.

To describe the roads of Turkey, the country will be divided into sectors tied on to the railway net and generally radiating outwards from the plateau to the coasts and frontiers. The plateau railway permits the resources of the country to be moved from one sector to another. Communications in each sector enable those resources to be concentrated at any point on the railway. Outside the sectors European Turkey forms a separate region by itself.

Road Sectors and Regions

Roads will be summarized in the following regions:

I. *European Turkey.*

II. *The Black Sea Coastlands.*
- (*a*) Western Sector, based on Ankara.
- (*b*) Central Sector, based on Sivas.
- (*c*) Eastern Sector, based on Erzurum.

III. *Western Anatolia.*
- (*a*) Northern Sector; Çanakkale, Marmara, and Bergama zones.
- (*b*) Southern Sector, fronting the Dodecanese.

IV. *The Southern Coastlands.*
- (*a*) Western or Antalya Sector.
- (*b*) Central or Adana Sector.
- (*c*) Eastern Sector.

V. *The Central Plateau.*

VI. *South-East Turkey.*
- (*a*) Mardin–Diyarbekir–Elâziz–Malatya.
- (*b*) Syrian Sector.
- (*c*) Iraq Sector.

VII. *Eastern Turkey.*
- (*a*) Erzurum Sector.
- (*b*) Bitlis–Van Sector.
- (*c*) Communications between Elâziz and the Kara Su.

I. EUROPEAN TURKEY

THE topography of European Turkey has been described in volume I, pp. 116–21, where it is shown that the region has three physical components: (1) the Istranca highland behind the Black Sea coast, rising to 3,340 feet near its northern end; (2) the Tekir Dağ and Koru Dağ behind the Marmara coast and continued into the Gelibolu peninsula; and (3) the valleys of the Meriç and its eastern tributary the Ergene, which drains the landward slopes of both highlands.

Five facts of topography are significant in the communication pattern of European Turkey. (1) Along the frontier with Greece the marshy valley of the Meriç provides a serious obstacle, and the only bridges are the road bridge at Petrades (Palaiokhori), 1¼ miles south of Kuleliburgaz, the railway bridge at Kuleliburgaz (Pythion), and the old Byzantine bridge at Edirne (fig. 62). North of Edirne the Tunca tributary of the Meriç is also marshy, though four bridges link Edirne with its suburbs on the right bank, one of them carrying the road along the Meriç valley to Svilengrad in Bulgaria. (2) The Ergene valley provides a natural and historic route from Edirne to Istanbul. (3) The character of the rivers presents the most serious obstacle to communications. From streams normally passable on foot they may, in a few hours during summer rains or spring thaw, become raging torrents. Thus the valleys of the Ergene tributaries and in the Istranca Dağ are steep-sided gulleys needing many bridges. (4) The mountains present few difficulties of height, but, especially in the Istranca Dağ, are wooded or thickly covered with scrub, and sparsely populated. (5) The coasts are almost everywhere steep and inaccessible, with few ports or landing-places. Backed by the highlands, they have therefore been shut off from the natural route of the Ergene valley and, except for the Bosporus and the ports, few points are linked by road with the interior.

The roads have been constructed almost entirely to meet strategic needs, and are based on the natural passage of the Ergene lowland, one of the world's great highways (I, p. 120). Edirne, at the confluence of the Tunca and the Meriç is the most important route-centre, and is linked directly with the two straits—the Bosporus by the main Istanbul road, and the Dardanelles by the lateral road through Havsa, Uzunköprü, Keşan, Kavak, and Gelibolu.



FIG. 61. *Sazlidere bridge* (*No. 9*)

(1) *Istanbul–Edirne* (148 miles)

The Istanbul–Edirne road, said to be the best in Turkey, makes use of the Ergene valley which also takes the railway; but while the railway is forced by its limiting gradient to keep closely to the Ergene river and then to cross from Uzunköprü over the Meriç river into Greek territory before reaching the Karaağaç suburb of Edirne, the road, after following the coast from Istanbul to Silivri, crosses to the Ergene basin at Çorlu, and then passes straight to Edirne, crossing the whole succession of the Ergene's northern tributaries. Thus the distance between Istanbul and Edirne by road is only 148 miles, against 198 miles by railway, and the fact that the road keeps to Turkish territory throughout adds to its strategic importance.

The minimum width of the road in Turkey is 16½ feet. By 1938 the surface had been asphalted between Istanbul and Lüleburgaz (98 miles), and an additional 24 miles between Lüleburgaz and Edirne was asphalted that year. All bridges have been either fully

repaired, reconstructed, or replaced by new ones, though four between Büyük Karıştiran and Babaeski, and four between Silivri and Çorlu, may still be of timber. The three-span reinforced concrete girder bridge, 31 yards long, over the Sazli Dere (No. 9)[1] was completed in 1937 (fig. 61). Inspection posts are established to maintain the road in good order, and more than 35,000 trees have been planted along it, in a landscape where orchards, vineyards, and maize-fields provide the only cover.

From the Sirkeci station at Istanbul to Silivri the road is always within 5 miles of the Marmara coast. At Küçük Çekmece station it crosses the railway and then the narrow isthmus separating the Küçük

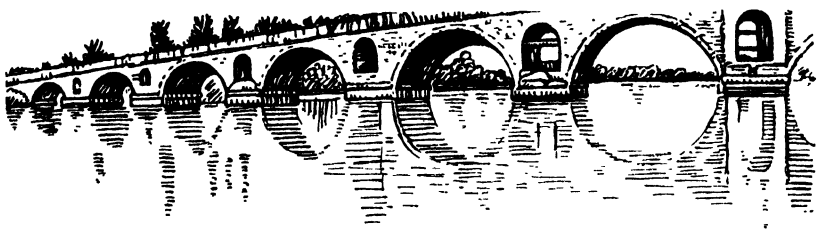


FIG. 62. *Byzantine bridge over the Meriç at Edirne*

Çekmece lagoon from the sea. At Büyük Çekmece, 12 miles farther west, it traverses the channels which join the Büyük Çekmece lagoon to the sea. The bridges at both lagoons are of stone or reinforced concrete. Between Silivri and Çorlu the road crosses the Kinik stream by a wooden bridge. A mile beyond Çorlu the railway crosses the road and a stone bridge takes the road over the Çorlu headstream of the Ergene. The bridge over the Ergene, 6 miles farther on, is of concrete. The road then proceeds through Büyük Karıştiran, Lüleburgaz, Babaeski, and Havsa to Edirne, reaching a gradient of 1 in 10 between the Kuleli bridge over the Inece stream and Havsa. Beyond Edirne the road is continued as a bad third-class road a further 12 miles to the Bulgarian frontier at Kapitan Andreovo, and thence through the Balkan States. Besides this bridge, three others link Edirne with the suburbs on the right bank of the Tunca river; and the old Byzantine bridge over the Meriç takes a road to Karaağaç (fig. 62), leading across the railway which here passes through Turkish territory, and through Ortaköy within the Bulgarian frontier to the Greek coast at Kavalla.

[1] Bridge numbers in brackets refer to the list of modern bridges on pp. 495–505 where additional details are given.

The Northern Roads

(2) *Edirne–Kirklareli–Silivri* (120 miles)

On the northern flank of the main Istanbul–Edirne road a road along the southern flanks of the Istranca Dağ leads from the main road 5 miles south-east of Edirne, through Kirklareli, Pinarhisar, Vize, and Saray to Silivri on the Marmara coast, where it rejoins the main road after crossing the railway at Çerkeşköy station. Reports differ regarding the state of repair of this side-road and its branch connexions, but it seems probable that much of the surface, though passable for cars in fine weather, has not yet been remetalled

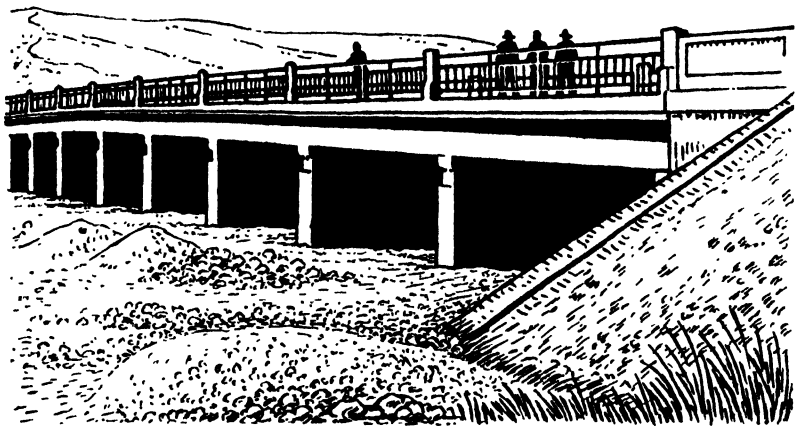


FIG. 63. *Inece bridge* (*No. 8*)

and may be impassable between September and March. The section between Edirne and Kirklareli, through Hasköy and Inece, came into full use in 1937 on the completion of the Inece bridge (No. 8), of reinforced concrete girder design with ten spans, totalling 118 yards, 9 miles from Kirklareli (fig. 63). The Ergene bridge (No. 4) over the Ergene near Saray was completed recently. Of reinforced concrete bowstring construction, it has a length of 25 yards, with a roadway 15 feet wide. Three other new bridges on this road are the Çayirdere (No. 6), of reinforced concrete with three spans totalling 33 yards, the Soğucak (No. 7), 8 miles north-west of Vize, with two spans, of similar construction, and the Poyrali (No. 5), of reinforced concrete, three spans, and a total length of 33 yards. The Büyükdere bridge, between Vize and Saray, was under construction in 1939.

There are four connecting links between the main Istanbul–Edirne road and the side-road through Kirklareli. (*a*) The first, 6½ miles long, joins Havsa with Hasköy, following the Süle Oğlu valley. (*b*) The second, from Babaeski to Kirklareli (22 miles), crosses the Kirklareli branch of the Istanbul–Edirne railway 2½ miles north of Babaeski, and runs parallel with it on the west. (*c*) The third (17 miles) joins Lüleburgaz with Pinarhisar, and (*d*) the fourth links Çorlu with the Saray–Silivri road 4½ miles south of Saray, crossing the railway 6 miles west of Çerkeşköy station.

Several branch roads from the side-road through Kirklareli cross the Istranca Dağ towards the Bulgarian frontier and the Black Sea coast. One (3) leads from Edirne through Lalapaşa to Vaysal, and is said to be a good military road kept in repair, though details have not yet been published. Another (4) joins Kirklareli to Dereköy, continuing over the border to Malko Trnovo and thence to Burgas on the Black Sea coast. Thus Kirklareli (formerly Kirk Kilise) is an important focus of routes on the northern flank of the main Istanbul–Edirne road. It is the chief town of the vilâyet of the same name, and besides its road connexion with Babaeski it is at the terminus of a branch line leaving the Istanbul–Edirne railway at Mandira (p. 267). Two other roads across the Istranca Dağ to the Black Sea Coast may be mentioned; the Poyrali–Demirköy–Iğneada (5) and Vize–Midye (6) cart-roads are said to have been made fit for motors, but it is unlikely that a direct motor-road exists between Vize and Midye. Possibly the Saray–Midye cart-road has been improved to take light motor-traffic, and probably neither road is more than roughly metalled.

The Southern Roads

(7) *Uzunköprü–Gelibolu* (75 miles)

An important first-class road has been constructed from Uzunköprü across the Yayla Dağ to Keşan, thence over the Koru Dağ to Kavak, Bolayir, and Gelibolu (Gallipoli) at the north end of the Dardanelles. It continues along the peninsula to Eceabat (Maydos). It has been completely reconstructed and has now no timber bridges, the four-span reinforced concrete girder Kavak bridge (No. 10) having been completed in March 1938 (fig. 64). Reconstruction of the worst part of the old road, in the Kavak valley, was completed in 1939, and the whole road is maintained by permanent road-gangs. It is the second most important road in European Turkey, but it must

be noted that Edirne has no direct link with Uzunköprü, but is connected with it by two branch roads from the main Istanbul–Edirne road. One (*a*) goes from Havsa through Kircasalih, with a branch to the railway at Pehlivanköy, and the other (*b*) through Kurt Tepe from the point where the main road crosses the Çalli stream 4 miles west of Havsa. There is also a road (*c*) across the Ergene and Meriç rivers, joining Uzunköprü to the railway (Istanbul–Edirne line) near Kuleliburgaz station on the frontier. It crosses the Meriç by the Palaiokhori bridge.

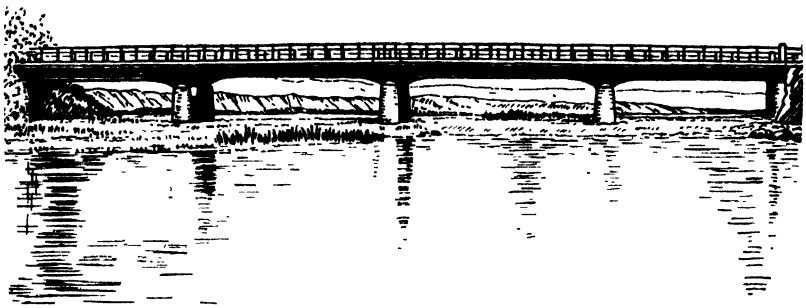


FIG. 64. *Kavak bridge* (*No. 10*)

Three roads radiate from Tekirdağ (formerly Rodosto), the Marmara port. One (8), through Muratli on the railway, to Büyük Karıştiran on the Istanbul–Edirne road, is fully bridged and metalled. It has fourteen small bridges and a major one (No. 3) of four spans, totalling 76 yards, over the Ergene near Muratli, which was finished in 1937 (fig. 65). Another (9) joins Tekirdağ through Malkara with Keşan on the Edirne–Gelibolu road, following the watershed between the Hayrabolu and Kavak streams. In the clayey hill-country around Malkara and Keşan, floods and mud create difficulties for vehicles in the rainy season (October–March) and after heavy rain. The section between Tekirdağ and Malkara is reported to be a bad second-class road. A continuation is projected to Ipsala, thence by a new bridge over the Ergene to Peplos where it would join the Greek road through Pherrai (Frecik) to Alexandroupolis (Dedeağaç). The third road (10) from Tekirdağ follows the Marmara coast to Şarköy.

There are also a number of cart-roads which would be motorable in fine weather and which could be improved. Of these the most important are (11) Kavak–Malkara–Hayrabolu–Babaeski, the last section of which, crossing the Ergene and then the railway near Alpullu station, has been reconstructed; (12) Ereğli–Çorlu, which continues

through Saray to Midye (*see above*) and branches 6 miles south of Saray to Istranca village, thence to the Black Sea coast near Karacaköy; (13) Şarköy–Gelibolu; (14) Şarköy–Malkara, across the Tekir and Koru hills; (15) Keşan to Enez at the mouth of the Meriç.

There are also a number of first-class roads radiating from the Istanbul area on the Çatalca promontory and within the 'Çatalca lines'. Among these may be mentioned the asphalted road (16), 13 feet wide and 30 miles long, from Edirnekapu (Istanbul) to Dağyenice, south of the Terkos lake; the macadamized road (17) along the

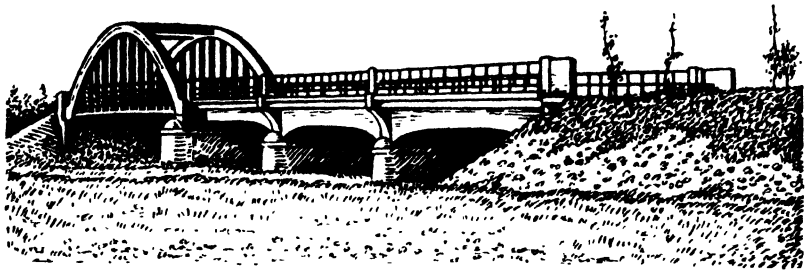


FIG. 65. *Ergene bridge* (*No. 3*)

western shores of the Bosporus, through Istinye, Büyük Dere, and Sariyer to Kilyos on the Black Sea coast; and the road (18) from Silahtarağa (Istanbul) through Kemerburgaz and Pirinciköy, which joins the Dağyenice road 9 miles north-west of Edirnekapu. Modern bridges have been built at two points on this latter road (Silahtarağa, No. 2, over the Alibey, and Sünnet, No. 1, over the Kâğithane). An asphalted road (19) from Florya beach (Yeşilköy) joins the Istanbul–Edirne road at mile 11 (km. 17·50).

It will be seen that the road pattern in European Turkey is a succession of lateral roads more or less parallel to the Greek and Bulgarian boundaries, fed by three main roads from the Marmara coast. The lateral roads may be summarized as follows:

(*a*) Hasköy–Havsa–Uzunköprü–Keşan–Kavak–Gelibolu.
(*b*) Dereköy–Kirklareli–Babaeski–Hayrabolu–Malkara–Şarköy.
(*c*) Iğneada–Demirköy–Pinarhisar–Lüleburgaz–Büyük Karıştiran–Muratli–Tekirdağ.
(*d*) Midye–Saray–Çorlu–Ereğli.

The three main feeder roads are the Istanbul–Edirne road in the centre, the Silivri–Saray–Kirklareli road on the northern flank, and the Tekirdağ–Malkara–Keşan road in the south.

European Turkey: Summary

Points where the roads connect directly with the railway are summarized below (rail-distance in miles from Istanbul in brackets):

Road (1) Istanbul, Küçük Çekmece (13·6), Çorlu (95·6), Lüleburgaz (132·6), Alpullu (142·9), Karaağaç (197·8); Edirne, terminus of a short branch from Karaağaç.
(2) Karaağaç (197·8), Çerkeşköy (80·4), Kirklareli (177·7), terminus of the Mandira–Kirklareli branch.
(2*b*) Babaeski, Taşağil, Kavakli, Kirklareli, on the Mandira–Kirklareli branch.
(2*c*) Lüleburgaz (132·6).
(2*d*) Çorlu (95·6), Velimese (88·0).
(3) Edirne.
(4) Kirklareli.
(7) Uzunköprü (169·1).
(7*a*) Pehlivanköy (156·2).
(8) Muratli (111·7).
(11) Alpullu (142·9).
(12) Çorlu (95·6).
(19) Florya (13·3).

Road Construction and Maintenance

Approximate provincial responsibility for road construction and maintenance is shown below; roads are listed by vilâyets in the order in which they occur in the text:

Istanbul: Istanbul–Kinik Dere (1); Çerkeşköy–Silivri (2); Edirnekapu–Dağyenice (16); Istanbul–Kilyos (17); Silahtarağa–Pirinciköy (18); Florya–Istanbul (19).

Tekirdağ: Kinik Dere–Lüleburgaz (1); Vize–Çerkeşköy (2); Çorlu–Saray (2*d*); Tekirdağ–Büyük Kariştiran (8); Tekirdağ–Keşan (9); Tekirdağ–Şarköy (10); Kavak–Alpullu (11); Ereğli–Saray and Karacaköy (12); Şarköy–Malkara (14).

Kirklareli: Lüleburgaz–Havsa (1); Kizilca–Vize (2); Havsa–Hasköy (2*a*); Babaeski–Kirklareli (2*b*); Lüleburgaz–Pinarhisar (2*c*); Kirklareli–Dereköy (4); Poyrali–Iğneada (5); Vize–Midye (6); Havsa–Kircasalih and Pehlivanköy (7*a*); Alpullu–Babaeski (11).

Edirne: Havsa–Edirne (1); Edirne–Kizilca (2); Edirne–Vaysal (3); Uzunköprü–Kavak (7); Kircasalih–Uzunköprü (7*a*); Edirne–Uzunköprü (7*b*); Uzunköprü–Kuleliburgaz (7*c*); Keşan–Enez (15).

Çanakkale: Kavak–Gelibolu (7); Şarköy–Gelibolu (13).

II. THE BLACK SEA COASTLANDS

COMMUNICATIONS between the Black Sea and the Central Plateau have always been difficult, partly because of rainfall and vegetation, but more particularly because of the barriers formed by the mountain blocks, split from the plateau along lines parallel to the coast, rising to 11,000–12,000 feet in Lazistan and only losing height west of the Kizil Irmak. Between the barrier blocks the great longitudinal trenches link up with each other to form comparatively easy communications; but it is again only west of Amasya that they expand into ample basins (*ovas*, I, p. 107). The rivers which drain these valleys parallel to the coast, e.g. the Çoruh, the Kelkit, and the Yeşil Irmak, the Devrez, the Gök, and the Sakarya, pierce the coastal barrier in gorges, which form obstacles rather than natural passages. Roads and railways which lead south from the coast tend to ignore them and to climb the steep passes. The road from Trabzon to Erzurum mounts to over 6,650 feet to cross the Zigana pass to Gümüşane on the upper Harşit and to 8,100 feet to cross the Kop Dağ near Bayburt. Three roads from the Kelkit valley cross the coastal ranges between Trabzon and Samsun to the little ports of Giresun, Ordu, and Ünye, but none take the gorges of the Yeşil or Kizil Irmak. Where tracks lead through such defiles they have to be cut into rugged rock walls or built on props and masonry.

At the northern edge of the mountains there is no continuous coastal plain. Many of the torrents have opened short valleys inland, but these are often separated by rocky ridges which isolate them. In recent years a coastal road has been constructed almost the whole way from Sinop through Trabzon to Hopa, but many difficulties have had to be overcome and many new bridges have had to be built; more will be needed before the road can be considered really good. West of Sinop the mountains fall even more steeply to the sea, so that in the vilâyets of Kastamonu, Zonguldak, Bolu, and Kocaeli there is no coastal road fit for wheels.

The coast from end to end gets a terrible battering from northerly winds in winter, and the parallel alinement of the mountains deprives it of naturally sheltered harbours, so that the only ports that have grown up are those where communication inland is rather better than elsewhere, e.g. Samsun, not far from the col of Kavak or Lâdik (2,600 feet) which takes the road and railway to Sivas. In the west the coal ports of Filyos, Zonguldak, and Ereğli are now tied to Ankara, and

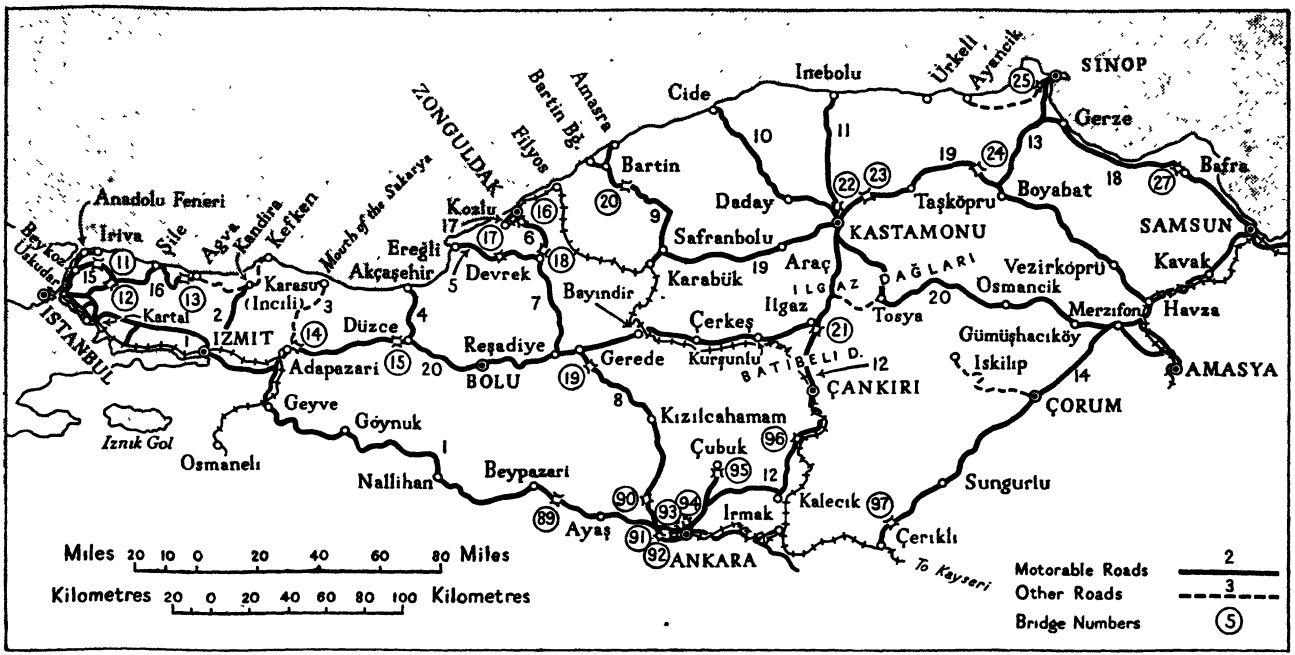


FIG. 66. *Road Map of the Ankara Sector, Black Sea Coastlands*

to the whole plateau, by rail and road, the former finding a difficult route by the Yenice (Filyos, Ulu) valley, and surmounting several plateau-blocks before reaching the Kizil Irmak.

Good communications then are few, though the need is great, especially because of the variety of resources, industrial as well as agricultural, and the fairly dense population which tends to crowd down to the small coast settlements or into the fertile *ovas* south of the coast range. Kastamonu, Merzifon, and Amasya are important towns inland, with growing industries, and the Black Sea ports, in spite of their exposure, are gradually being developed.

Here, as elsewhere in the coastlands of Turkey, the problem is to link the resources of the more favoured inland towns both with the sea and with the plateau, and it is economic, not strategic. In the whole length of 750 miles from the Straits to the Russian boundary there are only three railways: (*a*) from Haydarpaşa on the Bosporus by the Sakarya and Porsuk valleys to Ankara, (*b*) from Zonguldak and Filyos to Ankara, and (*c*) from Samsun to Sivas. Trabzon is joined to Erzurum by a good motor-road, which, as part of the trunk road to Persia, is one of the best in Turkey, though occasionally closed by snow in winter.

It is simplest to divide the whole region into three sectors, centred on Ankara, Sivas, and Erzurum, each with its own network of roads based on the three railways and this main road from Erzurum to the coast.

The three sectors will be limited on the coast by the Bosporus and Samsun on the west, by Sinop and Trabzon in the middle, and by Trabzon and the Russian boundary in the east. It should be noted that the first two sectors overlap. Roads are divided into three groups: (i) those from the coast inland; (ii) coastal roads; and (iii) lateral inland roads, though not necessarily in this order, which is not always convenient. The road pattern only is given, with brief notes of their suitability for various forms of traffic at the end of 1941, and with mention of modern bridges known to be completed.

Ankara Sector

Although communications in the Ankara sector have been greatly improved since the foundation of the Republic, the pattern is still far from complete, and the economic expansion indicated by the natural resources is accordingly retarded. Within the sector, in the fertile *ovas* which extend in long trenches parallel to the coastline, lies some

of Turkey's most productive agricultural land. The mountain blocks which separate the *ovas* provide a wealth of timber, particularly towards the coast; and the mineral resources, the coal of the Zonguldak basin, iron-ore at Çamdağ near Adapazari, lead and zinc at Çamdağ, Keskin, and Gümüşhaciköy, chrome near Kastamonu, and manganese at Kepez about 4 miles from Ereğli, indicate an industrial future of great importance when transport difficulties have been overcome. The great need is for better communication between the ports and the interior, together with improvement of port and harbour facilities.

Between the Bosporus and Samsun the only ports of any significance are the following: Iriva, Şile, Agva, Kefken, Incili (Karasu) at the mouth of the Sakarya, Akçaşehir, Ereğli, Zonguldak, and Filyos in the coal basin, Bartin 6 miles up the Bartin river (Koca Su), Amasra, Cide, Inebolu, Ürkeli, Ayancik, and the more sheltered port of Sinop, which, tucked away to the east of a peninsula, has the safest all-weather anchorage on the whole northern coast. Of these, Iriva, Filyos, Ürkeli, and Sinop recorded no trade in 1938, and Akçaşehir, Incili, Kefken, Şile, and Amasra only an insignificant amount. Yet compared with the rest of the Black Sea coastlands the Ankara sector is fortunate in its communications. It is served by the three railways mentioned above, of which the Ankara–Zonguldak line reaches the coast at Filyos, the Samsun–Sivas line links, by a tortuous route through Kayseri, the port of Samsun with Ankara, and the Haydarpaşa–Ankara line passes within 28 miles of the coast towards the Bosporus in the west. These are supplemented by the roads, which connect the coast with the railways, with the important centres in the inland basins, and with Ankara.

Thus the road pattern from the plateau to the coast is like an expanded fan based on Ankara, with some of the ribs broken where connexions are incomplete. The Bosporus is linked more or less directly with Ankara by a main road from Üsküdar through Izmit, Geyve, and Beypazari. Agva, Şile, and Iriva are tied to its western end, and Kefken through Kandira to Izmit, but Incili has only a poor road to Adapazari. Akçaşehir, Ereğli, Zonguldak, and Filyos are connected with Ankara through Reşadiye, Gerede, and Kizilcahamam, their roads from the coast joining the new main road from Izmit by Adapazari and Bolu to Ilgaz. Inebolu is directly connected with Ankara through Kastamonu and Çankiri. Samsun, at the eastern end of the sector, has a good motor-road through Havza, Çorum, and Sungurlu to Çerikli, whence Ankara can be reached by railway. The

other ports, Bartin, Amasra, Cide, and Sinop, have direct roads inland only as far as the Safranbolu–Araç–Kastamonu–Taşköprü–Boyabat line of *ovas*, along which a road parallel to the coastline ties the southern ends together, so that traffic on all can use the Kastamonu–Çankiri road over the difficult Ilgaz mountains. All the roads inland from the coast, except those from the Bosporus to Izmit, Kefken to Izmit, and Incili to Adapazari, have to climb to heights of 3,000 feet or more to surmount the coastal range, and if not carefully looked after they deteriorate rapidly. The lateral road between Safranbolu and Boyabat is continued eastwards along a structurally controlled reach of the Kizil Irmak valley to Havza on the Samsun–Çerikli road, and Safranbolu in the west has a good road to the industrial centre of Karabük on the railway between Zonguldak and Ankara. Thus Samsun and Zonguldak are linked by rail and road combined, about 40 miles inland from the coast, and Kastamonu stands out as the most important inland road-centre of the coastal belt.

An even more important lateral road parallel to this lies about 30 miles farther south, leaving the Adapazari–Bolu–Kizilcahamam–Ankara road (mentioned above) at Gerede, and linking Izmit, Düzce, and Reşadiye, on the west, with Ilgaz in the centre and Merzifon on the east. It makes use of the southern line of depressions, and forms a great natural line of communication from west to east through a part of the country otherwise served only by the railway between Bayindir and Kurşunlu stations on the Filyos line. The road follows the Ulu Su valley past Çerkeş, beyond which it crosses a col into the Devrez valley, to which it keeps as far as the junction with the Kizil Irmak; then after ascending the Kizil Irmak to Osmancik it leads up a tributary valley nearly to Gümüşhaciköy (Stanköy), thence to Merzifon. Already it is much used, though not yet up to first-class standard throughout (pp. 393, 395). A railway is projected along the same route to link Adapazari—and so Izmit and Haydarpaşa—with Merzifon and Amasya on the Samsun–Sivas railway (p. 256).

There are no coast roads in this sector fit for wheels except between Sinop and Samsun in the east, a small section 6 miles long from Zonguldak to Kozlu, said to be motorable in 1938, and the road linking Kandira, Agva, and Şile in the west. Even these are forced some miles inland by steep bluffs which reach down to the sea from the coastal range, or by the delta of the Kizil Irmak which extends 12 miles seawards beyond the foot of the hills. Some work has been reported on a coast road projected between Inebolu and Sinop, but by 1938 only the obstacles to traffic had been removed between Sinop and Ayancik

and only part of this section is passable for cars. Any road along this coast will be very expensive both to construct and to maintain.

Some notes on the roads of this sector, with approximate distances, are given below.

(*a*) *From the Coast Inland*

(1) *Üsküdar–Izmit–Geyve–Göynük–Beypazari–Ayaş–Ankara* (250 miles)

Work has been done on various parts of this road, which is generally about 16 feet wide but not fully metalled. As a through route, connecting the old capital with the new, it is passable for motors only

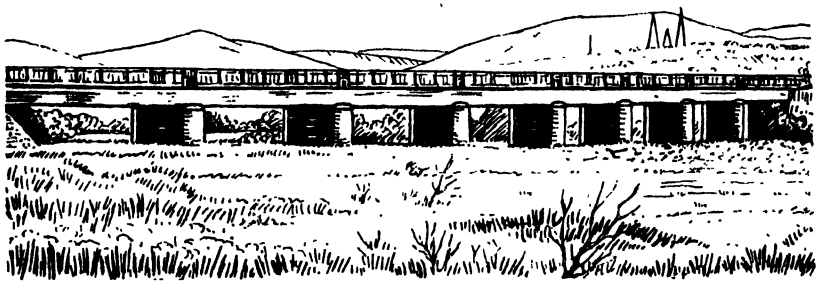


FIG. 67. *Onuncuyil bridge* (*No. 89*)

in dry weather, though shown on maps as a motor-road. Parts are well metalled and are regularly inspected, e.g. between Ankara and Beypazari where there is a bus service; the 36-mile stretch between Beypazari and Nallihan has recently been metalled, and the section between Nallihan and Geyve is in course of reconstruction (1942). There are some severe gradients, and many of the bridges are still of timber, though some are of reinforced concrete, notably the eight-span Onuncuyil bridge (No. 89; fig. 67), 127 yards long, over the Kirmir river 55 miles from Ankara, which was completed in 1934, and the Çayirhan bridge over the Aladağ Çay, 15 miles east of Nallihan. Approximate distances from Üsküdar are: Izmit 55 miles, Geyve 90 miles, Göynük 120 miles, Beypazari 190 miles, Onuncuyil bridge 195 miles, Ayaş 215 miles, Ankara 250 miles.

(2) *Kefken–Izmit* (40 miles)

From Kefken to Kandira (12 miles) this is only an earth track impassable in wet weather. From Kandira to Izmit it is believed to be roughly metalled, with a wooden bridge over the upper Çanak valley 6 miles beyond Kaymas and 12 miles from Izmit.

(3) *Incili–Adapazari–Geyve* (50 miles)

This is nothing more than a cart-track through the marshy plain of the lower Sakarya. It crosses the Sakarya near its mouth, from the small port of Incili on the left bank, to the village of Karasu where it turns inland through the rolling hills of the coast range to cross the Sakarya again at Sinanoğlu. For 7 miles it follows the valley of the Çark tributary, and beyond Söğütlü returns to the Sakarya valley, following the left bank through Adapazari to Geyve. South of Adapazari the road is metalled, and near Sapanca village, at the eastern end of the Sapanca lake, it joins the Üsküdar–Beypazari–Ankara road of which the Sapanca–Geyve section forms part. There are no details of bridges between Incili and Adapazari, and construction would certainly be difficult, as the Sakarya meanders considerably over a wide area of flood-plain and is liable to change its course. Near Adapazari the fine bridge built over the Sakarya by Justinian in A.D. 560 now has no connexion with the river, but spans the Çark tributary which marks its former course.

(4) *Akçaşehir–Düzce* (20 miles)

The road leads steeply up the small valley behind Akçaşehir, through the forests of the coastal range to a pass at about 1,160 feet over the Kaplandede Dağ, whence it descends more gently to the open Melen *ova* at Üsküb. It then crosses the Melen and a short tributary to Düzce, the centre of the basin. In 1927 the road was in very poor condition, used mainly by buffalo carts, but it is now reported fit for light motor-traffic, regularly inspected, and kept in repair. There are at least five bridges, probably of timber.

(5) *Ereğli–Devrek* (32 miles)

This is shown on maps as a motor-road, and is probably metalled, though little is known about it except that the bridges had been brought into a good state of repair by 1938. Several are of stone or concrete (fig. 68); the largest being the two-span Arslan bridge, 53 yards long, over the Çayli Oğlu stream, completed in 1929 (No. 17).

(6) *Zonguldak–Devrek* (25 miles)

This takes a rather easier alinement than the Ereğli–Devrek road, but has steep gradients. It is a good road, said to be fit for motors and to be kept in repair. The 'Ankara' bridge (No. 16) at Zonguldak over the Üzülmez (Düzülmen) stream, finished in 1928, is only 28 yards long, but the Devrek bridge (No. 18; fig. 69) at Devrek, completed in 1938, is a reinforced concrete girder bridge with three spans

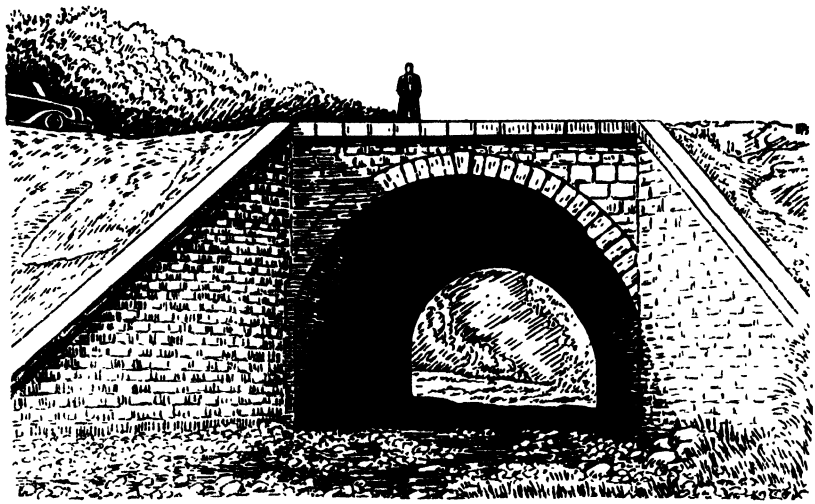


FIG. 68. *A culvert on the Ereğli–Devrek road*

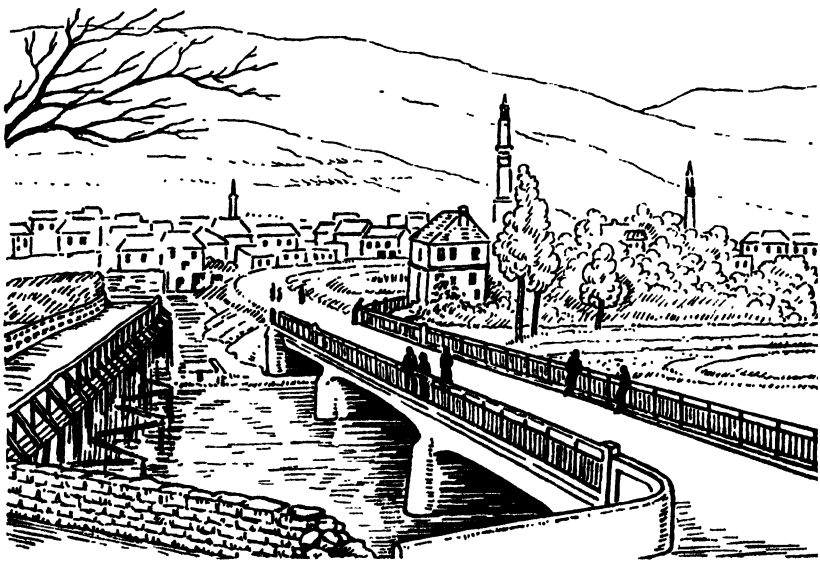


FIG. 69. *Devrek bridge* (*No. 18*)

and a total length of 66 yards; it replaces an old wooden one, and crosses the Devrek river, which fills all three spans with at least 7 feet of water when in flood.

(7) *Devrek–Reşadiye* (33 miles)

This road is not claimed on Turkish maps as other than a poor road under reconstruction, except for the first 13 miles, which is shown as macadamized; but in the vilâyet report of 1938 it was said to be regularly inspected and kept in repair. It has a number of old wooden bridges which do not seem to have been fully repaired or replaced. Traffic in this area makes use of the Filyos railway in preference to the

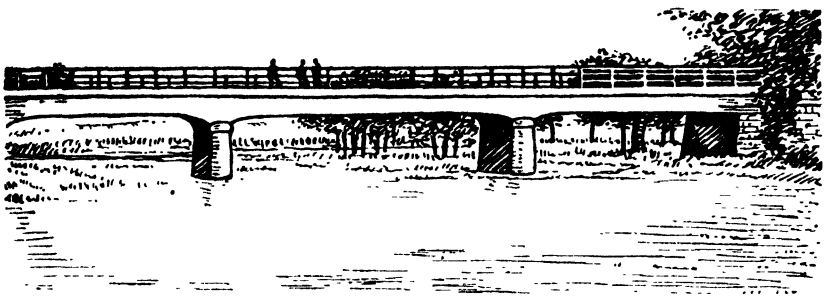


FIG. 70. *Afatlar bridge* (*No. 19*)

road, but the road link is most useful if kept in repair, for traffic is heavy and increasing.

(8) *Reşadiye–Kizilcahamam–Ankara* (95 miles)

This is a new road and is now regularly inspected and kept in repair. There are two new bridges of reinforced concrete, but the rest, except for the bridge over the Kurt tributary of the Ova Çay near Pazar, which is either of stone or concrete, appear to be of timber. Near Gerede the Afatlar bridge (No. 19; fig. 70), over the Ulu Su, with three reinforced concrete girder spans totalling 138 feet, was completed in 1937. The Ovaçay bridge (No. 90; fig. 71), with seven spans totalling 262 feet, completed in 1936, 35 miles from Ankara, shortens the road by about 6 miles. Formerly the Ankara–Reşadiye road made use of the Ankara–Üsküdar road from Ankara to the Zir bridge, 10 miles east of Ayaş, where the Ovaçay is crossed near its junction with the Ankara Suyu; it then turned north up the right bank of the Ova Çay in its course through the Mürted plain. After the construction of the new bridge 8 miles up the Ova Çay from the Zir bridge, the Reşadiye road was realined, leaving the Üsküdar road only 12 miles west of Ankara. There is a bus service between Gerede and Ankara.

(9) *Bartin Boğaz–Bartin* (7 miles), *Amasra–Bartin* (9 miles), and *Bartin–Safranbolu–Karabük* (50 miles)

These roads have all been reconstructed since 1923 and are said to be inspected and kept in repair and fit for motors. They were reported passable in 1927, and since then the growing activity of Karabük and its steel-works has increased their importance. Of the bridges shown on maps, two are of concrete (both across the Koca river near Çayirköy), and the bridge over the Kirazlik Su (No. 20), 55 yards long,

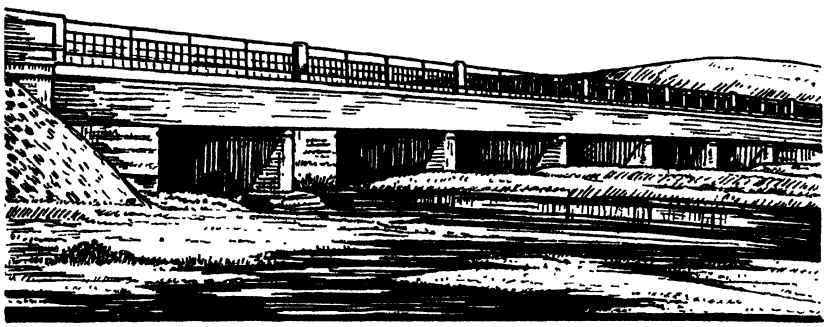


FIG. 71. *Ovaçay bridge* (*No. 90*)

was completed in 1928. There are no details published of the bridge over the Araç on the section between Safranbolu and Karabük. Between Bartin and Safranbolu the road makes use of the narrow valley of the Koca or Bartin river until 28 miles from Bartin it cuts across the flanks of Sariçiçek Tepe and descends to the first of the lowland troughs at Safranbolu. It therefore never rises much above 3,000 feet, though overlooked on the east and west by heights of well over 4,000 feet.

(10) *Cide–Daday–Kastamonu* (70 miles)

This is a difficult, winding mountain road, which makes use of a great shoulder between the deep valleys of the Koca (Kaya) Çay and Kisikiçi Çay to climb to a pass over 3,400 feet. It is said to be passable for wheeled traffic at all seasons, but except for the section between Daday and Kastamonu, where it makes use of the Daday *ova*, it is probably difficult for motors.

(11) *Inebolu–Kastamonu* (50 miles)

This road is an old chaussée, said to have been made passable for wheeled traffic at all seasons, and it is probable that light motor-traffic

can usually get through. The road was reported in 1927 to be well constructed. There are a number of wooden bridges which have not yet been replaced, and one three-span concrete bridge, 35 yards long, over the Gök Irmak north of Kastamonu, completed in 1938 (Şeker bridge, No. 22; fig. 72).

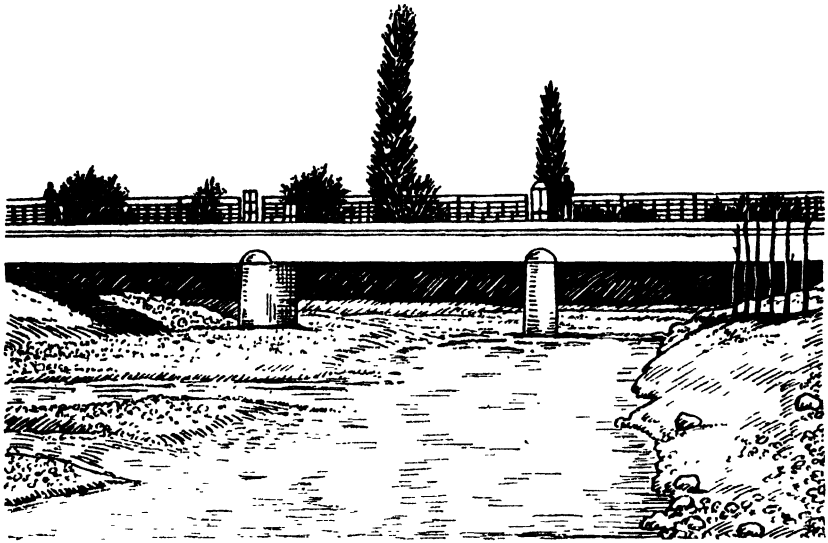


FIG. 72. *Şeker bridge* (*No. 22*)

(12) *Kastamonu–Ilgaz–Çankiri–Kalecik–Ankara* (150 miles)

This road completes the link between Ankara and the ports of Cide, Inebolu, Ürkeli, Ayancik, and Sinop. It is fit for light motor-traffic at all seasons. From Kastamonu it crosses the Ilgaz Dağlari by a pass under 6,000 feet, flanked by heights of 7,500–8,400 feet, to reach Ilgaz (2,970 ft.) in the Devrez trough. South of Ilgaz it crosses the Devrez by a new bridge (No. 21; fig. 73) of reinforced concrete, with five spans and a total length of 90 yards. This was made necessary by the heavy traffic which found the former timber bridge inadequate. Beyond the Devrez the road climbs over the Batibeli Dağ with heights of 5,085 feet on the west, 5,720 feet on the east, to the Tatli Çay, then leads down the Tatli Çay valley, parallel to the Filyos–Irmak railway, to Çankiri. Still following the railway, it reaches the Tüney (Terme) Çay, which it crosses at Tüney station by a modern reinforced concrete bridge (No. 96; fig. 74) with seven spans totalling 230 feet, completed in 1935. From this point it traverses open plateau to

Kalecik and Ankara. There is a regular bus service between Çankiri and Ankara, though the Çankiri–Kalecik section is reported to be only an earth track.

(13) *Sinop–Boyabat* (50 miles)

This road is a stone-surfaced chaussée, until recently in very poor condition, but by 1938 reported to be cleared of obstacles and improved. It turns inland from the coast and crosses the coastal massif at just over 4,000 feet, then descends to the depression of the Gök Irmak to reach Boyabat south of the river. Bridges are still of timber.

(14) *Samsun–Kavak–Havza–Merzifon–Çorum–Sungurlu–Çerikli* (170 miles)

This important road connects the port of Samsun with the Ankara–Kayseri railway at Çerikli. There is no through road to Ankara except by a long detour from Çorum through Yozgat and Keskin, described under the Central Plateau (p. 456). Leaving Samsun, the Çerikli road climbs a spur between two streams, parallel to and above the railway which it meets at Kavak, and which it then crosses and recrosses as they both traverse the Kavak pass at about 2,600 feet to Havza. Five miles farther on the road bifurcates, one branch following the railway to Amasya, the other to Merzifon. West of this town the road again forks, the main branch going south-west to Çorum, Sungurlu, and Çerikli, a station on the Kayseri railway 91 miles from Ankara. From this point, apart from the railway, only cart-tracks connect with Ankara, but these are probably motorable in dry weather. Since 1923 the whole road between Samsun and Çerikli has been reconstructed. Inspection posts have been established and it is said to be motorable at all seasons. Some of the bridges between Samsun and Havza are of stone or concrete, but many beyond Havza are still of timber. The Karabekir bridge (No. 97) over the Delice Irmak, the important plateau tributary of the Kizil Irmak, about 6 miles from Çerikli, has a single span of 105 feet, reinforced concrete bowstring design, completed in 1935. Other new bridges were being constructed in 1938 and should be finished now (1942), but details are not known.

(*b*) *Coast Roads*

(15) *Iriva–Anadolu Feneri–Beykoz–Üsküdar* (20 miles)

This is shown on maps as a cart-road between Iriva and Beykoz and as a motor-road from Beykoz to Üsküdar. Otherwise there are no

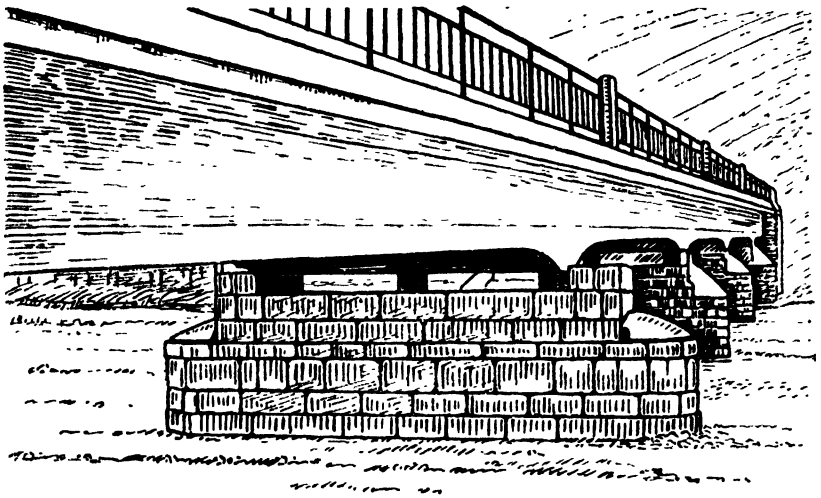


FIG. 73. *Devrez bridge* (*No. 21*)

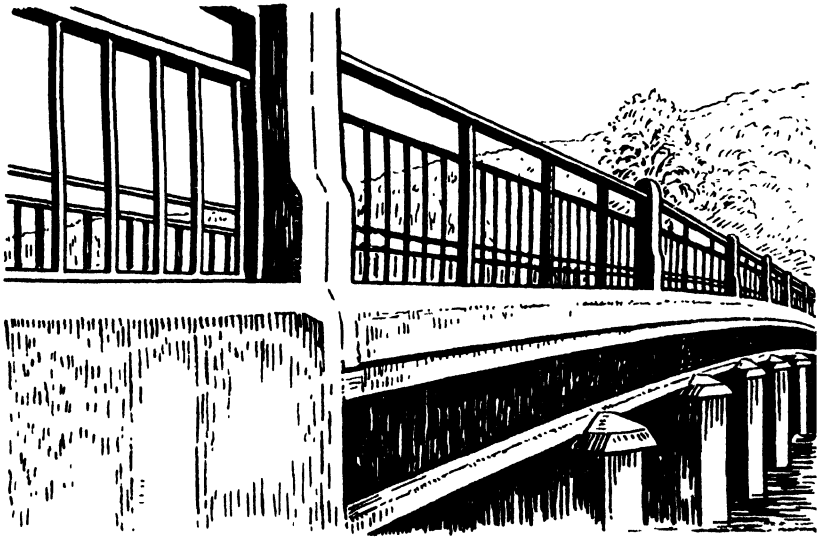


FIG. 74. *Tüney bridge* (*No. 96*)

details available. It is probably motorable throughout in dry weather, and between Beykoz and Üsküdar where it follows the well-populated shores of the Bosporus it is probably an all-weather road.

(16) *Kandira–Agva–Şile–Üsküdar* (75 miles)

Although described as a coast road, it is forced to wind inland by steep slopes which front the sea. The section between Kandira and Agva is probably nothing more than a poor cart-road, but from Agva to Üsküdar it is macadamized and forms an important link between the Black Sea coast and the Sea of Marmara. Between Agva and Şile the road is full of bends and lies well inland. It crosses the Gök Su by a new bridge (Göksu, No. 13), 32 yards long, completed in 1939. From Şile it turns south-west and before reaching the Iriva Deresi it forks, the main branch through Kisikli to Üsküdar, crossing the Iriva by the Ömerli bridge (No. 12), 79 yards long, completed in 1931, and the other through Bozhane, Mahmut Şevketpaşa, and Beykoz, crossing 8 miles lower down by the Iriva bridge (No. 11), 55 yards long, which was completed in 1925. All other bridges appear to be still of timber.

(17) *Zonguldak–Kozlu* (6 miles)

Only recently completed, this is said to be an excellent road, serving the coal-mines of Kozlu.

(18) *Sinop–Samsun* (100 miles)

Described under Sivas sector (p. 397) as part of the coast road from Sinop to Trabzon. The completion in 1939 of the Karasu bridge (No. 25) indicates that the road may be continued westward from Sinop to Ayancik. The bridge is of reinforced concrete and has three spans (53+59+53 ft.).

(*c*) *Lateral Roads*

(19) *Karabük–Safranbolu–Kastamonu–Boyabat–Havza* (200 miles)

This, the most northerly of the lateral roads making use of the great depressions, takes the place of a coast road in this sector, tying up the inland ends of the various roads leading from the ports and focusing them on Ankara. It follows the open Araç *ova* through Safranbolu and Araç, then climbs over an easy pass to Kastamonu in the Gök *ova*. Making use of the Gök valley, it crosses and recrosses the river, through Taşköprü and Boyabat, to reach the Kizil Irmak where the Gök joins it. After following the Kizil Irmak for about 20 miles it

turns south-east through Vezirköprü to Havza on the Samsun–Sivas railway.

From the steel centre of Karabük to Safranbolu the road is regularly inspected and repaired, but reconstruction between Safranbolu and Araç may not yet be complete. From there onwards to Boyabat the road is metalled and passable for motors at all seasons. 'Obstacles to wheeled traffic' only had been cleared between Boyabat and Vezirköprü in 1938, but a later map shows that this section has now been metalled and is presumably passable for motors, except perhaps after heavy rain. Thereafter to Havza the road is good.

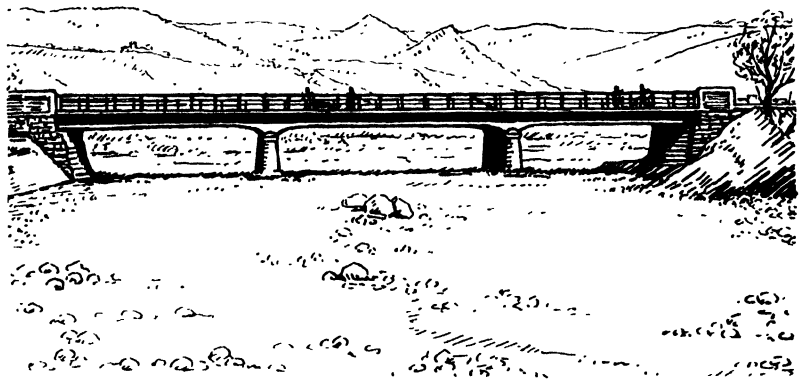


FIG. 75. *Kivrim bridge* (*No. 23*)

Most of the bridges are still of timber, but there are two modern ones of concrete. The Kivrim bridge (No. 23; fig. 75) over the Kivrim Çay (? Gök Irmak) east of Kastamonu, of reinforced concrete girder design, with three spans totalling about 138 feet, was finished in 1938; and the Fevzipaşa bridge (No. 24) over the Gök Irmak, 12 miles west of Boyabat, with two spans each of 85 feet, was completed in 1932.

(20) *Adapazari–Düzce–Bolu–Gerede–Ilgaz–Tosya–Osmancik–Gümüş-haciköy–Merzifon* (280 miles)

In its western section, between Adapazari and Gerede, this road provides an alternative route between Üsküdar and Ankara. It has here been reconstructed and metalled and is regularly inspected and repaired, but there are still some rough patches away from the towns. From Gerede it leads up the open upper valley of the Ulu (Yenice), over the watershed between the Ulu and the Kizil Irmak at about 4,000 feet, then down the Devrez valley to Ilgaz, where it meets the

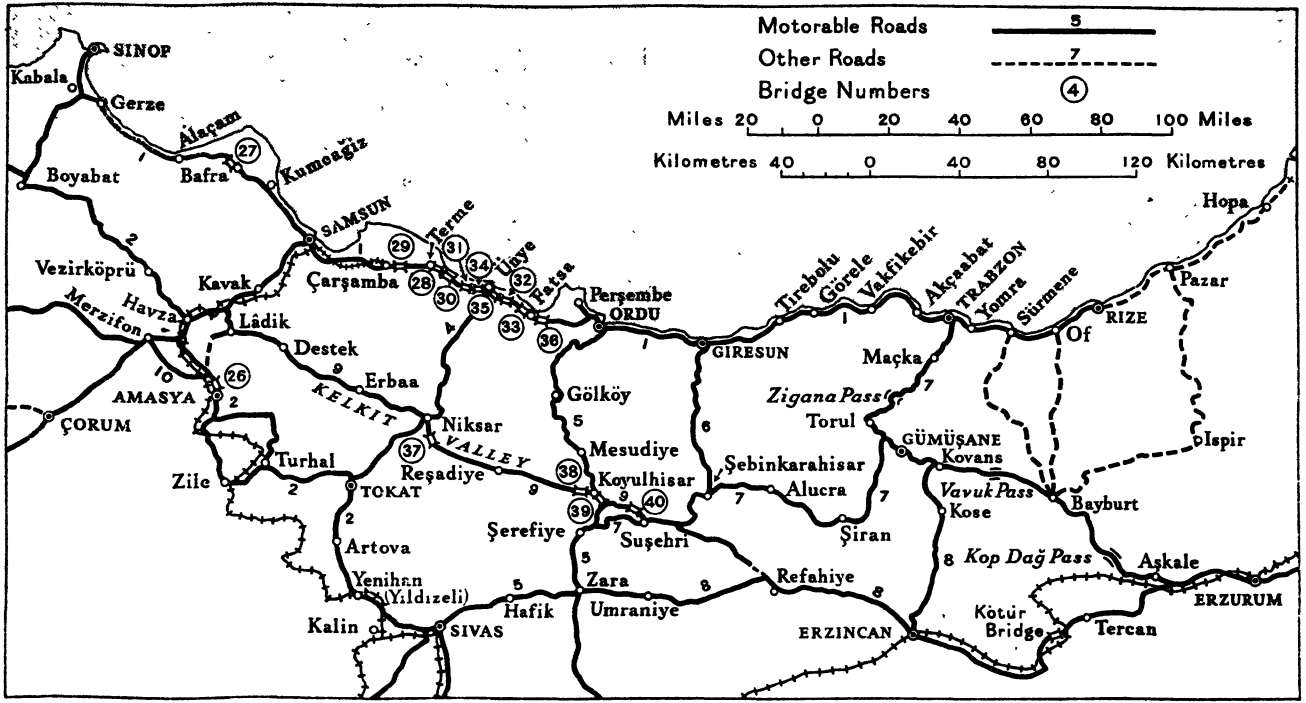


FIG. 76. *Road Map of the Sivas and Erzurum Sectors, Black Sea Coastlands*

Inebolu–Kastamonu–Ankara road. It is practicable for motors as far as Ilgaz, but between Ilgaz and Tosya the alinement is uncertain and the road may not yet be open for motor-traffic, though the Kastamonu vilâyet claims that it is passable for wheels at all seasons. From Tosya it follows the narrow Devrez valley and then the Kizil Irmak above the junction to Osmancik. In this section it may be difficult for motors, but thereafter, where it makes use of a tributary valley of the Kizil Irmak to reach Gümüşhaciköy, and then leads down to the northern fringe of the broad Sulu Ova at Merzifon, it has been brought into good repair and is said to be fit for motors at all seasons.

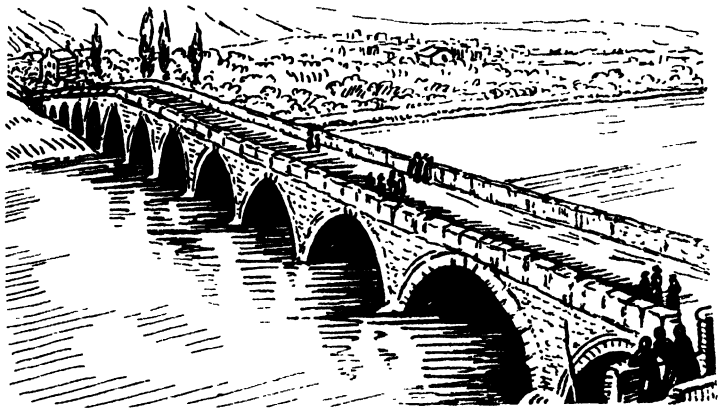


FIG. 77. *Old Koyunbaba bridge, Çorum–Osmancik road*

There are a large number of wooden bridges on this road, many of which will subsequently be rebuilt of reinforced concrete, and the fine old Koyunbaba masonry bridge at Osmancik over the Kizil Irmak is still in use (fig. 77). The important new bridge (No. 14; fig. 78) over the Sakarya 2½ miles east of Adapazari was completed in 1937. It has three bowstring reinforced concrete spans each of 115 feet, and the roadway is about 16 feet wide. Another new bridge, only recently completed, takes the road over the Melen river, between Hendek and Düzce (Merkiçmelen, No. 15). It is of reinforced concrete, with five spans (78+87+98+87+78 ft.) and a total length of 143 yards.

A branch from this road, probably fit for motors in dry weather, provides a shorter route between Tosya and Kastamonu.

SIVAS SECTOR

This sector, centred on Sivas, is limited west and east by the roads to Sinop and Trabzon. But whereas in the Ankara sector, which

overlaps it between Sinop and Samsun, the coast is convex to the land, here it is concave, so that most of it is nearer to the centre, and roads inland to the plateau are shorter and steeper. The coast here changes direction to east-south-east, and partly because of river deltas, partly because of geological accidents—volcanicity, and uplift of the land, which has raised level terraces above the sea—a coast road between Sinop and Trabzon is just possible. This has now been made fit for

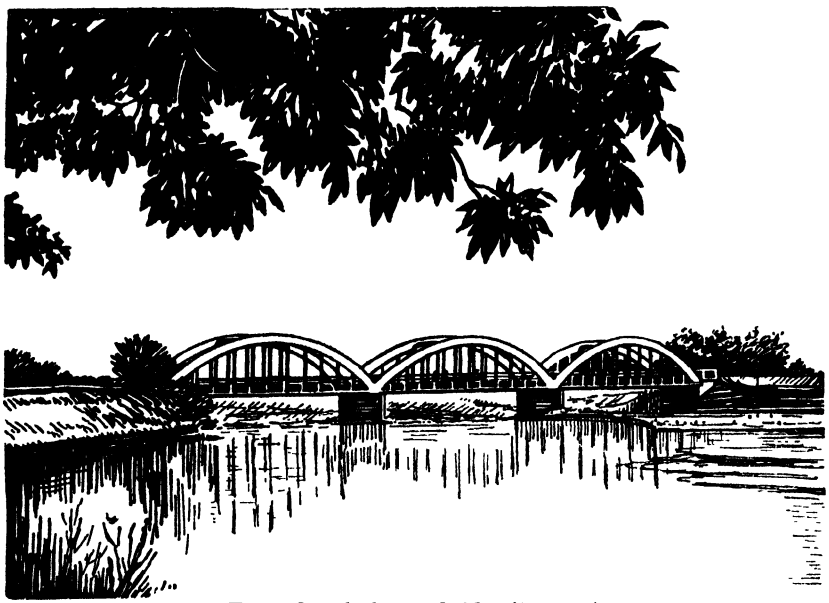


FIG. 78. *Sakarya bridge* (*No. 14*)

motors throughout, though some parts are worse than others, and a number of new bridges have been built over the main rivers and mountain streams, and work is constantly being done to improve and maintain it.

Only one railway, the Samsun–Sivas line (p. 311), serves this sector, so that roads are even more important than in the Ankara sector. Many detours are made necessary by the difficulties of the country; the roads leading inland have many bends, and the coast road has to cross the numerous torrents which furrow the slopes of the coast range. Only in the long structural troughs of the interior is any regular alinement possible.

Here again the roads form a fan pattern, though many of the ribs are far from straight. Samsun and Sivas are connected by a good

motor-road as well as by railway, though the two do not have the same trace throughout. The road serves Tokat and other smaller places off the line, and from Havza, on both road and railway, a good road leads through Boyabat to Sinop (p. 390), putting Sinop in touch with Sivas. At the east end of the sector, Trabzon is linked less directly with Sivas, through Torul, Alucra, Şebinkarahisar, Suşehri, and Zara. An alternative but longer road leaves the Trabzon–Erzurum road beyond Gümüşane and reaches Sivas by way of Erzincan.

Compared with the Ankara sector, there are fewer depressions in the interior, and there is accordingly only one great lateral road which uses the long trench of the Kelkit river as far as Suşehri. It joins the roads limiting the sector at Lâdik station in the west and at Suşehri in the east. As in the Ankara sector, roads from the ports (Ünye, Ordu, and Giresun) lead to the lateral road over the forested ranges which separate them from the interior; if carefully maintained, they are fit for motors and are used by light lorries up to 4 tons.

A great deal of methodical work has been carried out in the last few years, but details of condition are difficult to ascertain, since some vilâyets merely report that work is proceeding according to plan. Many of these mountain roads are liable to be carried away by landslips caused by heavy rain and snow, so that complete realinement is sometimes necessary. It should also be remembered that the whole region was severely shaken by the earthquakes of December 1939 (I, p. 392), and a new programme of reconstruction and repair must have been necessary.

Some notes on the roads in this sector are given below.

(*a*) *Coast Road*

(1) *Sinop–Trabzon* (300 miles)

For most of the way the road keeps close to the coast, but occasionally it goes a short distance inland to avoid some obstacle or to short-circuit a promontory or delta. It is passable for wheeled traffic throughout, and probably for motors, though some sections are not yet completed and much is still unmetalled (1940).

From Sinop the road goes inland to Kabala, where the Boyabat road leaves it, and then back to the coast at Gerze. In this section it is dependent on wooden bridges but is easily passable for motors. From Gerze to Alaçam, where it keeps close to the coast, it has been cleared of obstacles, and though it is not yet reported fit for motors, they can probably get through in dry weather. Thence to Samsun it has been

fully reconstructed; bridges have been repaired or replaced, and inspection posts established. It avoids the marshy Kizil Irmak delta by keeping inland between Alaçam and Kumcağiz, crossing the river at Bafra by a fine new bridge (No. 27; fig. 79) which was completed in 1937 at a cost of £T 221,000. With a total length of 275 yards, it has seven reinforced concrete bowstring spans each of 115 feet, and takes a heavy volume of traffic owing to the intensive tobacco cultivation of the district.

After keeping to the coast between Kumcağiz and Samsun the road is forced inland again by the delta of the Yeşil Irmak. It crosses the



FIG. 79. *Bafra bridge* (*No. 27*)

river at Çarşamba by a new bridge (No. 29) completed in 1931, with 12 spans totalling 243 feet. Between Samsun and Çarşamba the road is alined with the narrow-gauge railway which ends at the latter place, both keeping to the slightly higher ground on the landward border of the delta.

After reaching the sea again at Terme the road hugs the coast past the small port of Ünye to Fatsa and then cuts across the base of the Yasun promontory to Ordu. As far as Fatsa it was almost completed in 1938, and most of it was metalled; it should now be finished (1942). From Fatsa to Ordu obstacles to traffic had been cleared by 1938, and it is probable that the whole section between Samsun and Ordu is now fit for motors. Most of the larger streams have been rebridged by reinforced concrete girder bridges: four major ones, all of the same type—the Cevizdere (No. 35), Elekçi (No. 33), Akçaova (No. 32; fig. 80), and the Curidere (No. 34)—were completed in 1934. Three other bridges, Terme (No. 28), Miliç (No. 30), and Akçay (No. 31),

were completed in 1939 between Samsun and Ünye. The Bolaman bridge (No. 36; fig. 81), finished in 1936, over the Bolaman river just east of Fatsa, has a single bowstring span of 213 feet and a total

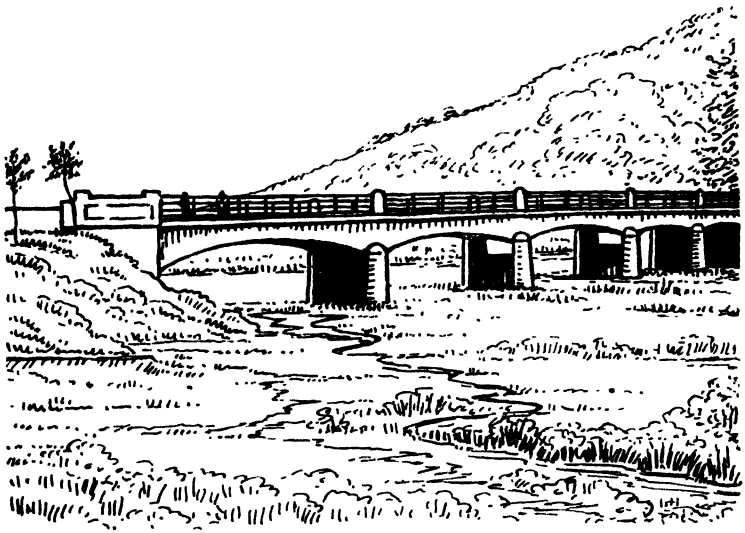


FIG. 80. *Akçaova bridge (No. 32)*



FIG. 81. *Bolaman bridge (No. 36)*

length of 82 yards, which is sufficient for normal floods; but the river has a large catchment and the valley is nearly 300 yards wide, so that heavy floods may endanger the structure.

From Ordu to Trabzon the road is close to the coast almost throughout, and construction was to be completed by 1939. In 1938 the Giresun vilâyet reported that work was proceeding according to programme, while in the Trabzon vilâyet it had been completed and the most important of the old wooden bridges had been replaced by reinforced concrete.

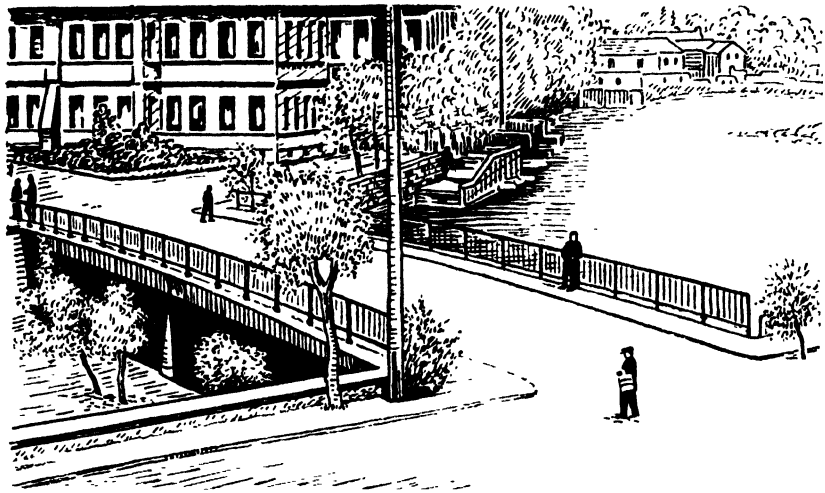


FIG. 82. *Yeşil Irmak bridge at Amasya* (*No. 26*)

(*b*) *From the Coast Inland*

(2) *Sinop–Havza–Amasya–Turhal–Tokat–Sivas* (260 miles)

As far as Havza this road has been described in the Ankara sector (pp. 390, 392); here it meets the Samsun–Sivas railway, by which the journey to Sivas is usually completed. The road, however, has been brought into good repair, and it follows the railway through the Suluova plain and then through the Boğazköy–Amasya defile. At Amasya it crosses the Yeşil Irmak (No. 26; fig. 82), leaving the railway on the left bank, and follows the more open valley for 8 miles before branching to give alternative routes to Tokat. One goes up the Ezine valley and then south to Turhal; the other crosses the Yeşil Irmak and then the railway, cuts across the hills to Zile, recrosses the railway which has forced the Yeşil Irmak gorge, and turns north-east to meet the other branch at Turhal on the railway. The Ezine valley road seems to be the most used of the two. From

Turhal, where it leaves the railway, the road has an easy route through the fertile Kaz Ova and the open valley of the Yeşil Irmak above it to Tokat (Hidirlik bridge?; fig. 83). Here, where the Ünye road joins it from the north-east, it turns south over the Ak Dağ and Çamlibel Dağ, through Artova and its lowland basin between the two mountain blocks, to Yildizeli on the railway, and thence to Sivas.

Inspection posts are to be set up along this road to keep it in good repair. There are still some wooden bridges, but several are of masonry or concrete.



FIG. 83. *Hidirlik bridge, Samsun–Tokat road (mile 150)*

(3) *Samsun–Havza* (45 miles)

This road has been mentioned in the description of the Ankara sector, as part of the Samsun–Çerikli road (p. 390); it crosses the Kavak pass and is a good road throughout. At Havza it joins the Sinop–Sivas road, from which the Çerikli road diverges 5 miles south of Havza.

(4) *Ünye–Niksar–Tokat* (75 miles)

This road leads inland from the small port of Ünye, winding up a great spur of the wooded mountain wall which backs the coast, to a pass at over 4,000 feet. It then descends to the Kelkit trough at Niksar (1,150 ft.) on the lateral road (p. 404). By 1938 almost the whole of this section had been reconditioned and the bridges repaired, when it was reported to be in good order for motors. Work was then being concentrated on reconstructing the section from Niksar to Tokat, and Tokat is now considered the 'delivery point' inland from Ünye, so that reconstruction should be completed. From Niksar the road crosses the Kelkit, makes use of a pass at over 3,000 feet, and

then descends to the trough of the Yeşil Irmak, which it crosses to reach Tokat on the left bank. Here it joins the Sinop–Sivas road.

(5) *Ordu–Mesudiye–Koyulhisar–Şerefiye–Zara–Hafik–Sivas* (140 miles)

Leading inland from the small port of Ordu, this road winds much more than the Ünye road, and climbs higher to cross the coastal range. The Melet river has here carved a deep trench through the range, so that the watershed is not far from the Kelkit trough. After passing Gölköy the road climbs to over 5,000 feet before taking the uppermost reaches of the Melet to Mesudiye (3,445 ft.) and the watershed. It then descends steeply to Koyulhisar (2,625 ft.) in the Kelkit trough, and after crossing the Kelkit by the Yukarikale bridge (No. 39), completed in 1939, has an easy route to Şerefiye. Beyond Şerefiye it ascends the Habes valley to a col at over 6,000 feet, flanked by heights of 7,000 feet and 11,745 feet in the Kizil and Köse mountains, and then descends the Çoban valley to Zara (4,760 ft.), in the uppermost reach of the Kizil Irmak. Thereafter it takes the easy route of the Kizil Irmak valley through Hafik (4,396 ft.) to Sivas.

The section between Ordu and Mesudiye was reported clear of obstacles in 1938, and reconstruction had begun. On a Turkish route map of the same period it is shown as passable for cars, and it is known to be used by lorries of up to 4 tons. The section from Mesudiye to Koyulhisar is probably not so good as the rest, but the link between the latter and Şerefiye is said to be good, and thence to Sivas the road is passable for motors.

A branch road southwards from Zara crosses the ranges which separate the Kizil Irmak from the Euphrates to Divrik (Divriği) (50 miles) on the Sivas–Erzurum railway, where lie the most important iron-ore deposits in Turkey.

(6) *Giresun–Şebinkarahisar* (50 miles)

This road has many features in common with the last two, all three shunning the ravines of the northward-flowing torrents, and all finding an easier route up the higher slopes or even the crests of ridges. Inland from Giresun, however, the watershed is much nearer the coast, and the Bağarsik and Şiran tributaries of the Kelkit have cut deep basins in the south face of the coastal range. Thus the road has less distance in which to reach the watershed, and the crest when reached at over 6,500 feet is higher than that farther west. Şebinkarahisar stands at

4,265 feet, so that the descent from the watershed, making use of the Arslanyurdu valley, is not difficult. A great deal of realinement has been necessary, and it is not certain whether the work is finished, though most maps show the road as fit for motors, and it is said to be used by 4-ton lorries.

(7) *Trabzon–Torul–Şiran–Alucra–Şebinkarahisar–Suşehri–Zara–Sivas* (225 miles)

The first part of this is the first-class road from Trabzon to Erzurum which is described in the Erzurum sector (p. 407). The Sivas road forks off from it 7 miles south-east of Torul, in the upper Harşit valley, and uses the valley of the Karamustafa tributary to reach the watershed at about 7,000 feet, whence it descends steeply to Şiran at 3,770 feet, on the Şiran tributary of the Kelkit. Both the Şiran and the Kelkit are here cutting difficult passages through the mountains, and are north of the trough followed by the Kelkit lower down. The road is therefore forced north-west down the Bağarsik valley through the Berdiga Dağ to Alucra, and thence to Şebinkarahisar, where it is joined by the road from Giresun. From Şebinkarahisar it turns south to the Endires plain in the Kelkit trough, crosses the Kelkit to Suşehri (3,117 ft.), and joins the Ordu–Sivas road 5 miles north-east of Şerefiye. The rest of the route to Sivas has been described above (p. 402).

Construction is proceeding between the Trabzon–Erzurum road and Alucra, and this mountain section would not stand up to continuous traffic for any length of time without constant repair. From Alucra to Sivas the road is said to be passable for motors. No new major bridges have been reported, and it is possible that timber bridges are being repaired or rebuilt.

(8) *Trabzon–Gümüşane–Erzincan–Refahiye–Zara–Sivas* (250 miles)

This, a longer alternative to that described above, leaves the Trabzon–Erzurum road about 10 miles east of Gümüşane. Details are not available, but it is believed to be fit for light motors in dry weather. It runs south from the Trabzon–Erzurum road, crossing the Kelkit within 10 miles of its watershed with the Çoruh, and rounding the western end of the Keşiş Dağ to Erzincan on the upper Euphrates. Thence it strikes west through Refahiye to Umraniye and follows the uppermost reach of the Kizil Irmak down to Zara, where it joins the road from Suşehri.

(c) *Lateral Roads*

(9) *Lâdik–Destek–Erbaa–Niksar–Reşadiye–Koyulhisar–Suşehri* (140 miles)

This road, which starts at Lâdik station on the Samsun–Sivas line, joins the two limiting roads of the sector, Samsun–Sivas and Trabzon–Sivas. It uses the Kelkit trough almost throughout and is, therefore, comparatively straight. It enters the trough at Lâdik (3,100 ft.), about 8 miles south of the station, and then uses the Destek defile to reach the Yeşil Irmak, which it crosses 10 miles above the junction with the Kelkit. The trough forms a natural routeway almost to Suşehri, and as far as Niksar is broad, sheltered, fertile, and well populated.

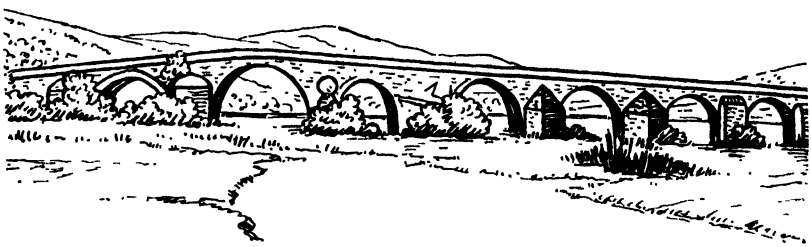


FIG. 84. *Old Talazan bridge near Niksar*

Erbaa (755 ft.) and Niksar (1,150 ft.) are both in the wide part, where irrigation and drainage projects are being carried out. The old Talazan bridge, 9½ miles west of Niksar, is still in good repair (fig. 84). Between Niksar and Koyulhisar (2,600 ft.) the valley is much more constricted, but beyond the latter the country opens out again and the trough can be traced as far as the upper Euphrates at Erzincan, making it possible to prolong the road from Suşehri eastward through Refahiye to Erzincan.

The whole road is being reconstructed, and will form part of the great highway from Adapazari to Erzurum. Work was begun at several points, and the completion of the road at an early date was projected. Parts of it probably can as yet only be counted on to take motors in dry weather. The fine new Fadli bridge (No. 37; fig. 85) over the Kelkit between Niksar and Reşadiye, with a single reinforced concrete span of 118 feet and a total length of 60 yards, was completed in 1937. The Aşağikale bridge (No. 38), completed over the Kelkit in 1939, takes the road from Reşadiye to Koyulhisar on the north bank. Beyond Koyulhisar the Akçaağil bridge (No. 40; fig. 86) was

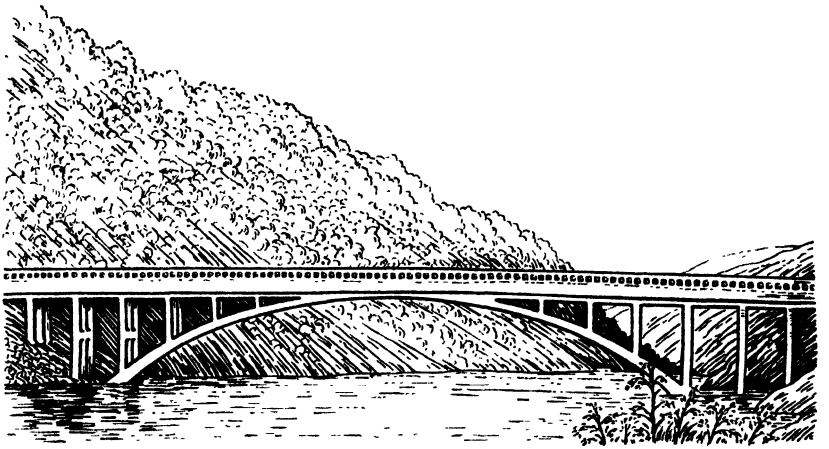


FIG. 85. *Fadli bridge* (*No. 37*)



FIG. 86. *Akçaağil bridge* (*No. 40*)

completed in 1933. It has two bowstring reinforced concrete spans each of 115 feet, with a roadway 13 feet wide.

(10) *Merzifon–Amasya* (30 miles)

This short road through the Sulu Ova links the Sinop–Sivas and Samsun–Çerikli roads, thus connecting the lateral road through Gümüşhaciköy in the Ankara sector with the limiting road of the west end of the Sivas sector, as well as linking Merzifon with the railway at Amasya. It appears to be fit for motors, at least in dry weather.

Erzurum Sector

The road pattern of the Erzurum sector of the Black Sea coastlands cannot be likened to a fan. The coast range, from the longitude of Trabzon to the Russian frontier, made up of the Kolat, Yamanli, Tatus, and other massifs, is nearly 10,000 feet above sea-level in the west and over 12,000 feet in the east. It rarely falls below 8,000 feet and never below 6,000 feet. Deep under snow in winter and heavily forested on the northern slopes, it is crossed at no point east of the Zigana pass by any track fit for wheels; nor is the valley of the Çoruh, which lies parallel to the coast and the coast range, an easy line for a through route. At many places it is enclosed and almost trackless.

The importance of this sector lies entirely in the fact that Erzurum, the strategic centre of north-east Turkey, is based on the port of Trabzon; indeed, before the completion of the railway to Erzurum, this link with the Black Sea was vital. It suffered much during the War of 1914–18, but has now been entirely reconstructed; and besides its strategic function, it serves as the first part of an important trade route into Persia, a factor of great significance for the development of Trabzon as a commercial port (p. 51).

Between 1915 and 1917 much roadwork was done by the Russians, and they built a light railway from Trabzon almost to the top of the Zigana pass. Another railway was started from Batum to Trabzon and tunnels were constructed at least as far as Pazar (Atina). The Trabzon–Zigana line was still there in 1927, but the rails have now been removed and bridges and other works have fallen into disrepair. A number of steam-rollers were left behind by the Russians, and after an interval of some years they were repaired and used by the Turks.

Only two other roads are passable for motors in this sector: the coast road from Trabzon to Hopa, and the frontier road from Hopa

to Borçka and Artvin. Work is still proceeding on the former, and it is only maintained with great difficulty. Bridges are frequently being carried away by the torrents coming down from the coastal mountains. Those over the Karadere at Sürmene and over the Kalenüma near Akçaabat are often down, and a stone bridge at Yomra has been washed away and replaced by planks; but no information concerning the condition or state of reconstruction of the road is available, except that in 1939 six wooden bridges were being reconstructed with masonry piers and concrete superstructure between Rize and Hopa. The Hopa–Artvin road is best considered as part of the road-net of eastern Turkey, for it is too close to the U.S.S.R. and to Batum to have any significance except as a strategic frontier road (p. 482).

The lack of motor-roads across the Tatus range adds to the importance of three bridle-paths, from Of and Sürmene to Bayburt and from Pazar (Atina) through Hemşin to Ispir. They are roughly paved with stones owing to the heavy rainfall and deep mud, but are used a good deal by the Lazis of the district (I, p. 346), for they have the advantage of being about 50 miles shorter than the highway from Trabzon over the Zigana pass. In winter they are impassable, but in summer they carry a lively traffic when cattle, sheep, and goats are driven over to the harbours for export.

The only road, therefore, that will be described in this sector is the all-important one from Trabzon to Erzurum. Beyond Erzurum to the Persian boundary it will be outlined among the roads of eastern Turkey (p. 484).

Trabzon–Erzurum (206 miles; 331 km.)

Part of the old caravan route to Persia, this road has been throughout history the chief artery of north-east Turkey, but reconstruction was not begun until 1931. Almost the whole of it was in ruin, sections of the roadway had been carried away by landslips, much of the remainder was obstructed, all of it was narrow, and it lacked serviceable bridges. Work was first concentrated on clearing obstructions, building bridges, culverts, and retaining walls, and planning proper drainage. There are said to be forty-one new bridges, all of reinforced concrete, and designed to take loads up to 50 tons. The road is now 23 feet wide and it has been metalled throughout (fig. 87). Management is entrusted to the Ministry of Transport, which runs about forty German-made lorries and buses on the road, and a regular bus service to Erzurum. Inspection posts are of the bungalow type and serve the double purpose of housing road-maintenance detachments

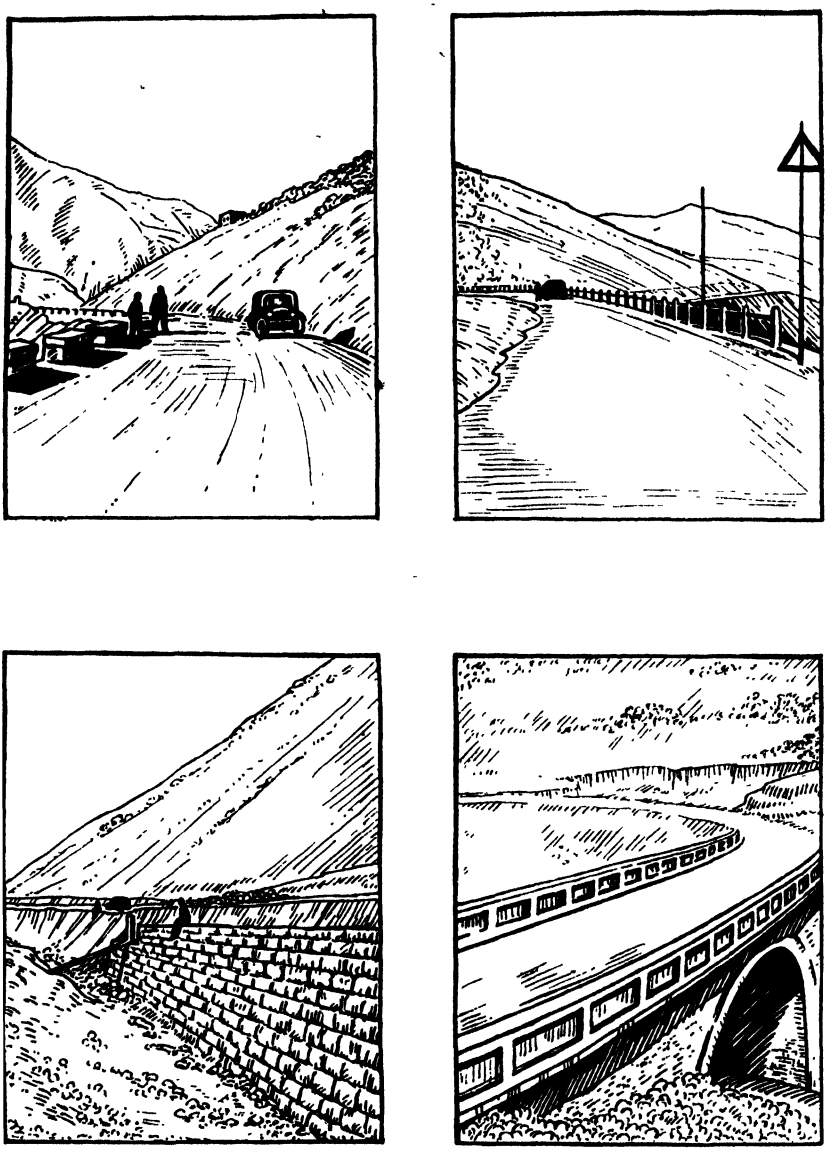


FIG. 87. *The Trabzon–Erzurum–Bayazit trunk road*

and of affording shelter to travellers held up through snow or other causes (fig. 88). All have a large room to accommodate eight workmen, with bathroom, lavatories, and garage. Some have also a separate room for the road superintendent. A motor snow-plough is kept at Hamsiköy at the foot of the Zigana pass, and it is claimed that the road is kept open and in repair all the year round, except for about twenty or thirty days when the snow lies too deep to clear, and progress becomes impossible.

The road leaves the coast a mile east of Trabzon and follows the valley of the Değirmen southwards, gradually climbing to the Zigana pass (6,675 ft.) over the Alaca Dağ. It then descends to Torul (3,050 ft.) in the upper valley of the Harşit or Karşut Su, a river which carves a difficult passage north-west to the Black Sea just east of Tirebolu, on the coast road between Giresun and Trabzon. The Erzurum road follows this valley upstream, sending off a branch road to Şiran, Alucra, and Sivas (described in the Sivas sector, p. 403), and reaches Gümüşane (I, photo. 46, p. 110).

Between Gümüşane and Kovans another road branches south through Köse to Erzincan. After Kovans the main road climbs to a second pass (Vavuk) of nearly 6,500 feet, and crosses the Lori tributary of the Çoruh (I, p. 114), to reach the Çoruh valley at Bayburt (5,100 ft.). This town (population 10,350 in 1935), where the Çoruh is crossed, is the market for the intensively cultivated Bayburt Ovasi which, drained by the Lori, lies to the west; and Bayburt has a wider significance as the junction of natural highways. On it converge the tracks from the Black Sea harbours of Pazar (Atina), Of, and Sürmene, and the east–west track along the Çoruh valley and the Kelkit trough. Thus its commercial importance is great, and the more local traffic is swelled by that using the new highway from Trabzon to Teheran.

From Bayburt the road follows the Çoruh, here known as the Masat (I, p. 114) upstream, and after leaving it, turns south over the Kop Dağ pass (8,100 ft.), whence it descends to the Kara Su or uppermost Euphrates (Firat). It follows this, with the railway on the opposite bank until after the crossing is made near Aşkale, whence both continue on the left bank to Erzurum (6,100 ft.). Between Bayburt and Aşkale trees of the quick-growing variety, chiefly willow, were being planted along the road in 1937.

The branch road from 8 miles east of Aşkale to Erzincan (90 miles) links the trunk road with the Sivas sector, meeting the Refahiye road (p. 403) at Erzincan. This link cuts across the mountains which fill

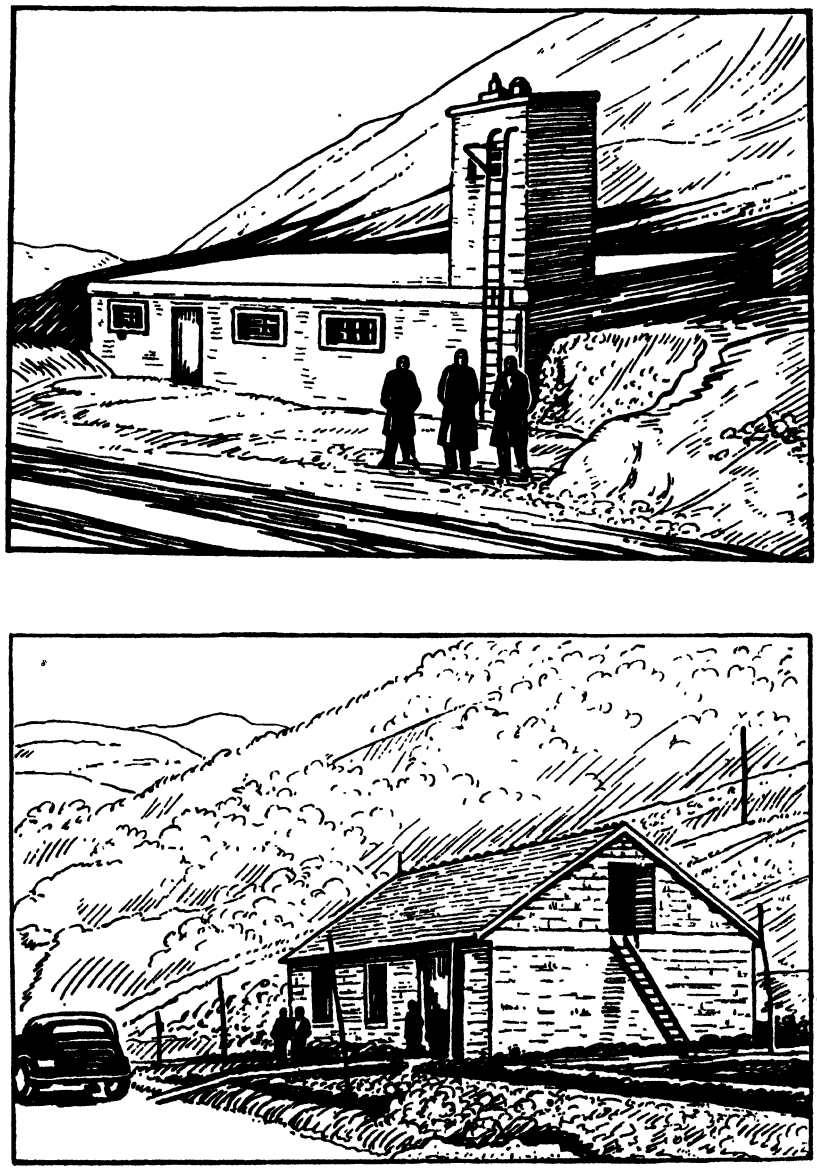


FIG. 88. *Rest-houses on the Trabzon–Erzurum–Bayazit trunk road*

the great bend of the Kara Su, thus short-circuiting the railway which follows the river. From Tercan the road traverses the south-east end of the Tercan Ovasi, crosses the railway and then the Euphrates by the wooden Kötür bridge (photo. 79), whence it follows the Euphrates (Firat, here known also as the Tuzla and Balaban) to Erzincan.

It is believed to be fit for motors throughout, though possibly only in dry weather.

Black Sea Coastlands: Summary

Points where the chief roads connect directly with the railways are summarized below:

Ankara Sector

Road (1) Maltepe, Kartal, Pendik, Gebze, Izmit, Sapanca, Geyve, stations on the Haydarpaşa–Eskişehir line (Rly. 2), and Etimesut and Ankara, stations on the Eskişehir–Ankara line (Rly. 3).
(3) Adapazari, on the branch from the Haydarpaşa–Eskişehir line (Rly. 2).
(9) Karabük, on the Zonguldak–Ankara line (Rly. 11).
(12) Çankiri, Tüney, Kalecik, on the Zonguldak–Ankara line (Rly. 11).
(14) Samsun, Kavak, Lâdik, Havza, on the Samsun–Sivas line (Rly. 12), and Çerikli, on the Ankara–Kayseri line (Rly. 4).
(17) Zonguldak, on the Zonguldak–Ankara line (Rly. 11).
(20) Bayindir (Ismetpaşa), Çerkeş, Kurşunlu, on the Zonguldak–Ankara line (Rly. 11).

Sivas Sector

Road (1) Samsun, Dikbiyik, Çarşamba, on the narrow-gauge extension from the Samsun–Sivas line to Çarşamba (Rly. 12 *a*).
(2) Havza, Hacibayram, Boğazköy, Amasya, Zile, Turhal, Yildizeli, Sivas, on the Samsun–Sivas line (Rly. 12).
(5) Divrik (Divriği), on the Sivas–Erzurum line (Rly. 7).
(8) Erzincan, on the Sivas–Erzurum line (Rly. 7).

Erzurum Sector

Saptiran, Aşkale, Kandilli (Karabiyik), Kaplica (Ilica), Erzurum, on the Sivas–Erzurum line (Rly. 7).

Road Construction and Maintenance

The following shows the approximate provincial responsibility for the upkeep of the various roads described above; roads are listed by vilâyets in the order in which they occur in the text:

Ankara Sector

Istanbul:	Üsküdar–Kartal (1); Iriva–Üsküdar (15); Agva–Üsküdar (16).
Kocaeli:	Karţal–Tarakli (1); Kefken–Izmit (2); Incili–Geyve (3); Kandira–Agva (16); Adapazari–Hendek (20).
Bolu:	Tarakli–Nallihan (1); Akçaşehir–Düzce (4); Hendek–Gerede (20).
Zonguldak:	Ereğli–Devrek (5); Zonguldak–Devrek (6); Devrek–Gerede (7); Bartin Boğaz–Bartin (9); Amasra–Bartin (9); Bartin–Karabük (9); Zonguldak–Kozlu (17); Karabük–Samatlar (19).
Kastamonu:	Cide–Kastamonu (10); Inebolu–Kastamonu (11); Kastamonu–Ilgaz (12); Samatlar–Taşköprü (19); Tosya–Kastamonu (20).
Çankiri:	Ilgaz–Tüney (12); Gerede–Tosya (20).
Ankara:	Nallihan–Ankara (1); Gerede–Ankara (8); Tüney–Ankara (12).
Çorum:	Dökenci–Çerikli (14); Tosya–Gümüşhaciköy (20).
Sinop:	Sinop–Boyabat (13); Sinop–Alaçam (18); Taşköprü–Vezirköprü (19).
Samsun:	Samsun–Havza (14); Vezirköprü–Havza (19).
Amasya:	Havza–Dökenci (14); Gümüşhaciköy–Merzifon (20).

Sivas Sector

Samsun:	Alaçam–Ünye (1); Lâdik–Destek (9).
Amasya:	Havza–Turhal (2); Amasya–Merzifon (10).
Tokat:	Turhal–Artova (2); Niksar–Tokat (4); Destek–Reşadiye (9).
Ordu:	Ünye–Piraziz (1); Ünye–Niksar (4); Ordu–Koyulhisar (5).
Sivas:	Artova–Sivas (2); Koyulhisar–Sivas (5); Suşehri–Sivas (7); Umraniye–Zara (8); Reşadiye–Suşehri (9).
Giresun:	Piraziz – Vakfikebir (1); Giresun – Şebinkarahisar (6); Alucra–Suşehri (7).
Gümüşane:	Torul–Alucra (7); Gümüşane–Erzincan (8).
Trabzon:	Vakfikebir – Of (1); Trabzon – Torul (7); Trabzon – Gümüşane (8).
Erzincan:	Erzincan–Umraniye (8).

Erzurum Sector

Rize:	Of–Viçe.
Gümüşane:	Torul–Bayburt.
Erzurum:	Bayburt–Erzurum; Aşkale–halfway between Tercan and Erzincan.

III. WESTERN ANATOLIA

MORE road reconstruction has been carried out in this area than elsewhere in Turkey. The roads described are mainly in the following vilâyets: Kocaeli, Çanakkale, Balikesir, Bursa, Izmir, Manisa, Kütahya, Aydin, Denizli, Muğla, Burdur, and Antalya. Old roads followed the main valleys and linked Izmir and other smaller Aegean ports to the plateau. When the railways from Izmir up the Gediz, the Küçük Menderes, and the Büyük Menderes were built, they superseded the roads, which had fallen into disrepair, and the smaller ports lost their economic importance. The new road-net is based both on economic and on defence requirements, with emphasis on the latter, and may be divided into two sectors:

(i) the northern sector, fronting the Sea of Marmara and the Aegean as far south as Izmir;
(ii) the southern sector, fronting the Dodecanese Islands and the Aegean south of Izmir.

Each of these sectors has railway arteries leading back to the Central Plateau. The northern sector is based on the old Anatolian railway from Haydarpaşa through Izmit to Eskişehir and Afyonkarahisar, from which the artery runs down from Alayunt through Kütahya to Balikesir (p. 327), this important centre being connected by the railway—once a branch line of the old 'Smyrna–Kassaba' railway—with Bandirma on the Sea of Marmara and with Izmir (p. 323). The projected conversion of the Mudanya–Bursa line to normal gauge, and its extension to Bozüyük on the Anatolian railway will later strengthen the main communications of this sector (p. 256).

The arteries of the southern sector, centred on Afyonkarahisar, are (*a*) the old French railway from Izmir up the Gediz valley (p. 316), (*b*) the old British railway from Izmir by Aydin up the Büyük Menderes to Eğridir, now joined to the Anatolian railway by the new line between Karakuyu and Afyonkarahisar (pp. 330–8), and (*c*) the motor-road between Burdur, on a branch line of the Eğridir railway, and Antalya, on the south coast—a road which serves the eastern flank of the sector (p. 437). A railway between Burdur and Antalya is planned, and when constructed will strengthen the communications on the eastern flank (p. 256).

The completed lines all follow the natural grain of the country, and have largely superseded the old roads, which were particularly difficult to maintain in the valley bottoms, owing to flood and marsh,

though this trouble should be lessened by the various drainage and irrigation schemes now being carried out (pp. 154–9). Some of these old roads may be reconstructed later in the road programme.

The chief problem now is to build and maintain the lateral road communications—required particularly for defence purposes—linking up the railway arteries across the grain of the country. On these work has been concentrated. With the one important exception of the Izmir–Manisa–Balikesir–Bandirma railway, all lateral communication is by road, and very few of the reconstructed roads follow railway alinements. Most of the new roads are maintained in good repair by permanent road-gangs.

The Northern Sector

The structure and topography of the Marmara and Bergama regions are described in vol. I, pp. 122–33. The former region comprises the Çanakkale highland block in the west, and in the east three other highlands separated by the lowlands of the Iznik–Gemlik trough and the Manyas–Bursa depression. Along the southern shore of the Sea of Marmara the coastal mountains fall steeply to the sea, and the problem of the road-maker is to cross these mountains to the inland troughs, where natural lines of communications permit junction to be made with the railways. In this northern sector there are two such nodal points, Bursa and Balikesir, while Bilecik in the north-east and Manisa in the south-west serve much the same purpose at the extremities of the sector.

(*a*) *The Çanakkale Zone*

The road system of this zone centres on Balikesir, the important military base of the area. No part of the railway net reaches the coast between Bandirma and Izmir, and the only continuous coastal motor-road north of the Gulf of Edremit is from Kumkale at the southern entrance to the Dardanelles, through Çanakkale to Lapseki (Route 1). Elsewhere there are only occasional discontinuous cart-roads and rough paths; only indifferent tracks, fit for wheels in places, connect Çanakkale and Lapseki with Biğa and Karabiğa. South of Kumkale the bluff coast drives the roads inland, and a road connexion (Route 2) is gradually being made through Ezine and Ayvacik to Ilica at the head of the Gulf of Edremit. Ilica is directly connected by a good road through Edremit to Balikesir (Route 3), and from Çanakkale a first-class motor-road (Route 4) leads directly

inland through the Koca gap, by Çan, Yenice, and Balya to Balikesir. From Karabiğa on the Marmara shore and from Ezine on the Çanakkale–Ilica road there are motor-roads to Çan (Routes 5, 6), and another motor-road connects Edincik and the Gulf of Erdek with Gönan (Route 7). This last goes no farther, but a cart-road connects Gönan with Biğa.

There are in addition a number of cart-tracks, on some of which work has been done, so that they may be passable for cars in dry weather. The most important of these leads from Kumkale, through Geyikli to Gülpinar, and then turns inland to Ayvacik.

Balikesir thus forms the forward railway base of this north-west corner, with Çan an advanced road-centre for the Dardanelles coast. Some further details of these roads are given below.

(1) *Kumkale–Çanakkale–Lapseki* (46 miles)

This road, along the eastern shore of the Dardanelles, is fit for motors in all weather, but has some rough places between Çanakkale and Lapseki. Between Kumkale and Çanakkale it keeps close to the coast, crossing the Kepez stream by a stone bridge and the Koca near its mouth by a concrete one. Between Çanakkale and Lapseki it diverges from the coast, which is followed only by a rough track. A continuation of this road along the coast to Karabiğa (36 miles) was reported to be under construction in 1941, but unless the work has been completed it is still only passable for wheels in dry weather.

(2) *Çanakkale–Ezine–Ayvacik–Ilica* (70 miles)

This road leaves the Çanakkale–Kumkale road 3 miles south-west of Erenköy and leads over the hills past the site of ancient Troy to Ezine in the Menderes valley. To this point it is an all-weather motor-road and a bus-route, the Dumrek and Koca (Kemer) streams being crossed by wooden bridges and the Menderes by the Arslan bridge (No. 48; fig. 90), 98 yards long, completed in 1935, of reinforced concrete girder design. From Ezine to Ayvacik the road is rough and only motorable in dry weather, though it improves on both sides of Ayvacik. Thence it crosses wooded hills to the coast at Küçük Kuyu, but degenerates to little more than a bridle-track, and is not much better from here to Ilica along the coast.

(3) *Ilica–Balikesir* (63 miles)

From Ilica (Akçay), a small port near the head of the Gulf of Edremit, a good motor-road crosses the lowland plain of the Havran

river to Edremit and Havran, whence it climbs steeply to a col at over 1,970 feet, descends to the Kocaafşar valley, crosses the river, and traverses hilly country to Ergama. Between Ergama and Balikesir the lowland is liable to flood and the road has to be embanked. It is an all-weather motor-road throughout, and has one large bridge of five

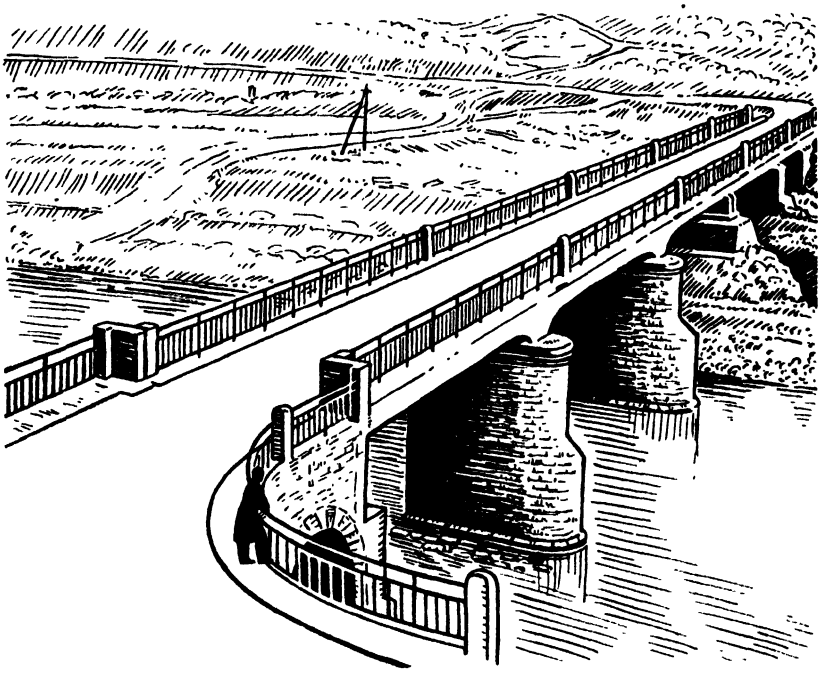


FIG. 90. *Arslan bridge* (*No. 48*)

spans with a total length of 280 feet (Güngörmez, No. 58) over the Kocaafşar.

(4) *Çanakkale–Balikesir* (130 miles)

This is the most important road in the Çanakkale zone, and is really first-class, fit for two, and in some places, three, lines of traffic, with all the old bridges replaced by modern ones. It is used by a regular bus service, the whole journey taking 7 hours. From Çanakkale the road follows the gap of the Koca river across the highland rim, and traverses the plateau to the Çan (Koçabaş) river at Çan. In this section, besides the major bridges (Nos. 41, 42, 43, 44) there are ten other bridges, all of stone or concrete. From Çan the road continues through Yenice, across the Gönan river to Balya, where it

turns south to meet the Ilica–Balikesir road in the Kocaafşar valley 21 miles west of Balikesir. In the section between Çan and Balikesir there are seventy bridges besides the major ones (Nos. 45, 46, 47, 58), all of stone or concrete. Forty-three of these, chiefly of stone, lie between Balya and Balikesir, where the road is banked to prevent it being flooded, and are large culverts rather than bridges.

(5) *Karabiğa–Çan* (33 miles)

This road, connecting the Marmara coast with Balikesir, though classed as a motor-road, is believed to be only roughly metalled and in poor condition. Of the many bridges, only five are of reinforced concrete, and the section between Karabiğa and Biğa, across the swampy plain of the lower Çan (Kocabaş), depends on wooden bridges, many of which are weak.

(6) *Ezine–Bayramiç–Çan* (70 miles)

From Ezine the road follows the left bank of the Menderes to Bayramiç, and continues up the valley to cross a col between the Kocakatran Dağ and Eğri Karaağaç Dağ. It descends from the watershed by the valley of the Gonik Agonya, a tributary of the Gönan, and reaches the Çanakkale–Balikesir road where it crosses the Gonik Agonya at Yenice, 20 miles south-east of Çan. The road is an all-weather motor-route throughout, though rather narrow. The last section, from Bayramiç to Yenice, has a width of about 19 feet, and has only recently been completed.

(7) *Erdek–Gönan* (30 miles)

This road, connecting the small Marmara port of Erdek with the inland centre of Gönan, is only roughly metalled, but is usually passable for cars. It follows the coast from Erdek and crosses the narrow isthmus of the Kapidağ peninsula to Edincik, whence it follows the low watershed between Lake Manyas and the Gönan river to Gönan town on the right bank.

(*b*) *Marmara Zone*

East of Bandirma, the road-net conforms closely to the topography. The mountain blocks are alined parallel to the southern coastline of the sea of Marmara, and the natural lines of communications are along the inland depressions from west to east. The most important of these, the Bursa depression, has a motor-road throughout its length (Route 8); a gap in the coast range allows the western end of

this road to reach the sea at Bandirma, which is joined to Edincik and Erdek, while the eastern end joins the 'Anatolian' railway at Bilecik. The road not only serves the rich Bursa depression and links two railways between Bandirma and Bilecik, but it ties up the ends of short roads leading inland over the coastal range from the Marmara shore, and so takes the place of a coastal road. Thus Erdek, Edincik, Bandirma, Tirilye, Mudanya, and Gemlik are all in touch with the railways and with each other. From Bursa there is an alternative connexion with the 'Anatolian' railway at Karaköy; this makes use of the lowland at Inegöl. The two are connected by a road between Inegöl and Yenişehir and at their eastern ends by the old main road which follows the railway and then continues through Inönü south to Kütahya, along the edge of the Central Plateau, avoiding the detour to Eskişehir.

The road from Bursa to Gemlik climbs steeply over the coast range and then, from the head of the gulf, follows the Iznik depression to Orhangazi at the north-west corner of Lake Iznik before turning north again to cross the Samanli Dağ to Yalova on the Gulf of Izmit. From Yalova to Izmit almost the only coastal motor-road in this region follows the southern shore of the gulf. This road (Route 10) links the chief towns of the Kocaeli and Bursa vilâyets and the ports of Gemlik and Yalova between them. There are various other motorable roads in the Kocaeli–Bilecik–Bursa area of less importance, which are shown on the accompanying map and annotated below.

South of the Bursa depression, road construction is less advanced. The problem here is to connect the towns and villages in the tangled belt of the Balikesir hill-country, either with the road in the Bursa depression, or with the railway between Balikesir and Kütahya. On the west a motor-road follows the general route of the railway from Bandirma to Balikesir; from near Karacabey another road crosses the depression and reaches this road and railway near Göbel. Farther east, roads from Bursa through Orhaneli and from Inegöl through Domaniç are being extended to Tavşanli on the Balikesir–Kütahya railway; and in the extreme east, Tavşanli is joined to Kütahya by a rough motor-road.

South of the Tavşanli depression the chief barrier to modern roads is the highland-block between it and the railway in the Gediz lowland. The valley of the uppermost Simav river cuts into it from east to west and accentuates the obstacle of the Gökseki, Demirci, and Simav mountains. But the whole region is a tangle of broken hills, and from Balikesir only two motor-roads lead southwards, one along the Izmir

railway to Soğucak (Route 18), the other south-east to Sindirği; there are no others except a branch from the Kütahya–Uşak road to Simav, which will be described with that road when the Bergama zone is dealt with (p. 427).

(8) *Bandirma–Bilecik* (125 miles)

This important road follows the Bursa depression. It leaves the Bandirma–Balikesir road near Siğirci station, north-east of Lake Manyas, keeps to the northern edge of the depression through



FIG. 91. *Hanifidere bridge* (*No. 51*)

Karacabey and past Lake Apolyont, crosses to Bursa on the southern edge, continues to Yenişehir in the Gök valley, and passes between the Avdan and Ahi highlands to Bilecik. It is rough-surfaced, but passable for cars in all weather. The worst part is between Siğirci and Karacabey; it is better between Karacabey and Bursa; between Bursa and Yenişehir it is metalled and fairly good; but from Yenişehir to Bilecik there is only an earth track, fit for cars in dry weather.

The eastern alternative leaves this road near Kestel, 8 miles east of Bursa, and turns south-east through Inegöl in the upper basin of the Gök to Karaköy on the Anatolian railway. It is metalled and in good condition. Both branches are linked by the Karaköy–Bilecik road (15 miles) down the Kara Su valley.

Of the many bridges on these roads some are of wood, some of stone or iron, and some of concrete. The wooden bridge over the Simav near Karacabey has been replaced by one of reinforced concrete (Hanifidere, No. 51; fig. 91), completed in 1940. It is 45 yards

long, with three spans of 42, 50, and 41 feet, and a roadway 16 feet wide. The Hasanpaşa bridge (No. 52), 107 yards long over the Koca river, 5 miles south-east of Inegöl, was completed in 1936 and has nine straight reinforced concrete spans.

(9) *Inegöl–Geyve* (60 miles)

The connexion between Inegöl and Yenişehir following the Gök valley is probably only a dry-weather motor-road. From Yenişehir a new road crosses the Avdan Dağ to Iznik. No details are known of the road beyond Iznik, where it turns east along the depression, crosses the railway at Mekece, and follows the railway down the Sakarya valley to Geyve, there meeting the Üsküdar–Beypazari–Ankara road (p. 384) of the Black Sea coastlands.

The road connexions between Bilecik, Kütahya, and Eskişehir will be described in the section dealing with the Central Plateau (pp. 454–5).

(10) *Bursa–Gemlik–Yalova–Izmit* (90 miles)

From Bursa this important road crosses a tributary of the Nilüfer by an iron bridge 40 yards long, and climbs steeply to 820 feet to cross the coast range before descending again to Gemlik. It follows the Iznik depression to Orhangazi at the north-west corner of Lake Iznik, climbs to 1,600 feet to cross the Samanli Dağ, and reaches the Gulf of Izmit at Yalova. From here the road follows the southern shore of the gulf to Izmit.

As far as Yalova the road is 16 feet wide, asphalted, and in good condition for motors. Two reinforced concrete bridges, Yalova (No. 53) and Samanlidere (No. 54), were completed at Yalova in 1939 to fulfil the need caused by the increasing popularity of the town as a health resort. Beyond Yalova the road was being reconstructed in 1939, but no details are available. The Yalakdere bridge (No. 55; fig. 92), with one reinforced concrete bowstring span, two side spans, and a total length of 58 yards, was completed over the Yalak Dere 7 miles west of Karamürsel in 1936.

A short branch-road, about which little is known, leads south from Karamürsel on the Gulf of Izmit. After crossing the Karlik Dağ it degenerates at Mamuriye into little more than a track.

(11) *Tirilye–Karaağaç* (16 miles)

This is only a dry-weather road, leading inland from the Marmara coast, across the Nilüfer, to the lateral road from Bandirma to Bursa (Route 8).

(12) *Mudanya–Bursa* (18 miles)

The shortest route between Bursa and the coast, this is a first-class asphalt motor-road with a width of 16 feet. Although there is a regular bus service, the importance of this road has recently been superseded by that of the new road linking Bursa with Yalova (Route 10), and most of the goods traffic uses the latter route. Mudanya is linked with Bursa also by narrow-gauge railway, the line running west of the road.

Tirilye and Mudanya are connected by 6 miles of asphalted road along the coast.

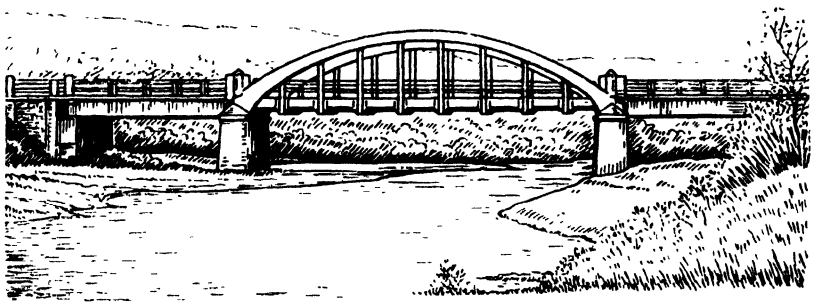


FIG. 92. *Yalakdere bridge* (*No.* 55)

(13) *Gemlik–Yenişehir and Iznik* (32 and 33 miles)

This road leaves the Bursa–Yalova road 5 miles east of Gemlik, and at Aş Sölöz, a village near the south shore of Lake Iznik, it turns south-east to join the Bursa–Yenişehir road 7 miles west of Yenişehir. It is probably fit for motors in dry weather, but no details are available, except that Turkish maps show it as fit for motors. There is also a road along the southern shore of Lake Iznik, probably fit for motors in fine weather only.

(14) *Bandirma–Balikesir* (60 miles)

This road, closely following the railway, has been fully reconstructed, and is now an all-weather motor-road with bridges capable of taking loads of 14 tons. It has a lowland course, and only once, near Balikesir, does it rise above 800 feet. From Bandirma it rounds the eastern end of Lake Manyas, and crosses the Kara Dere, which drains the lake to the Simav river, by the Karadere bridge (No. 50), which has six reinforced concrete spans and a total length of 98 yards, and was completed in 1937. From there the road traverses low hills to

the Simav valley near Göbel, crossing and recrossing the river before reaching Susurluk (Susiğirlik) by the Yahyaköy bridge (No. 49). At Göbel it is joined by the road from Mustafa Kemalpaşa, on the Kirmasti (Route 15). The bridge, of reinforced concrete with three spans of 79, 98, and 79 feet, was completed in 1938. The road follows the river for a short distance beyond Susurluk and then turns south-west to Balikesir.

From Bandirma two short roads connect with the Erdek–Gönan road (p. 417), one across the Kapidağ isthmus and the other to Edincik, so that the two ports are in touch with Balikesir.

(15) *Karacabey–Göbel* (30 miles)

This road leaves the Bandirma–Bilecik trunk road, crosses the marshy lowlands between lakes Manyas and Apolyont to Mustafa Kemalpaşa where the Kirmasti river leaves the highland zone, and follows the southern edge of the lowland westwards across the Kara tributary of the Simav to join the Bandirma–Balikesir road and railway near Göbel, about 6 miles north of Susurluk (Susiğirlik). On Turkish maps it is shown as a motor-road, but it is probably only passable for cars in dry weather.

(16) *Bursa–Orhaneli* (25 miles)

This road, believed to be metalled, rounds the western end of the Ulu Dağ (I, p. 131), rising to over 3,300 feet before crossing the upper valley of the Nilüfer at under 1,600 feet. Southwards it rises again to 3,300 feet in the Dümen Dağ, then descends to the Koca river, which it crosses to reach Orhaneli. The road is probably fit for motors in dry weather, and is planned as a first-class road to meet the Kütahya–Balikesir railway at Tavşanli.

(17) *Inegöl–Domaniç* (25 miles)

This, too, is a metalled road, planned to reach Tavşanli. It leaves the Bursa–Karaköy road 5 miles south-east of Inegöl and climbs to a col at over 4,000 feet between the Yirce and Domaniç massifs. Beyond Domaniç it is believed to be still no more than a track, and no bridges are reported to have been constructed.

(18) *Balikesir–Soğucak* (15 miles)

This road follows the railway, and is passable for motors, though with considerable difficulty in wet weather. Beyond Soğucak the road is only an earth track and becomes quite impassable after rain.

(19) *Balikesir–Sindirği* (35 miles)

This highland road through Çağiş and Bigadiç is reported to be good and fit for motors in all weather, though most of the bridges appear to be still of timber and may be washed away by heavy rain.

(*c*) *The Bergama Zone*

The coast and topography of the Bergama region are described in vol. I, pp. 79–81 and 131–3. For convenience, the roads across the hill country separating the Bakir and the Gediz valleys, the connexions between Menemen, Manisa, and Izmir, and the roads north of the railway artery from Izmir up the Gediz to Afyonkarahisar are included here.

The Bergama zone is more fortunate than the other two northern zones, in that a good road follows the coast, or is able to keep fairly close to the coast, all the way from Edremit to Aliağa, though the last section from Aliağa to Izmir crosses the Dumanli Dağ and short-circuits the Foça promontory. Tracks from the various bays and anchorages lead inland to the road where it lies away from the coast, and there is a motor-road from Foça. The Bergama–Soma and Menemen–Manisa roads make use of river valleys to penetrate the interior, connecting with the Manisa–Balikesir railway, and another road follows approximately the line of the railway between Manisa and Soma.

In the north the Ilica–Balikesir road has already been described (Route 3). With the aid of the railway from Soma to Balikesir the communications thus form a rough figure of eight.

There is a dearth of roads between the Gediz and the Balikesir–Kütahya railway across the plateau blocks to the north, but an important road connects Uşak directly with Kütahya, and from it branch roads lead to Simav and Emet. Extensions are projected beyond these points, but there is no definite information that any work has been begun.

Thus the road pattern again is incomplete, and the difficult mountain block enclosed by the railways, served only by rough hill-paths in its central region, is still an obstacle to traffic.

(20) *Edremit–Izmir* (125 miles)

This strategic road leaves the Edremit–Balikesir road 2 miles east of Edremit and runs south-westward across the plain of the Havran river, crossing several streams by stone or concrete bridges to Burhaniye,

where low hills push the road towards the coast. Immediately south of Burhaniye, the Karinca Dere is crossed by a reinforced concrete bridge (No. 59; fig. 93), 82 yards long, with seven spans, which was completed in 1937. The road then touches the coast south of the river mouth and follows the southern shore of the Gulf of Edremit, avoiding the headlands of Bağlar Burnu and Boz Burun, but reaching the coast again at the small port of Ayvalik opposite the Mosko islands. From Ayvalik it turns south-east, keeping within 4 miles of the coast, across the Altinova plain to Dikili, the port for

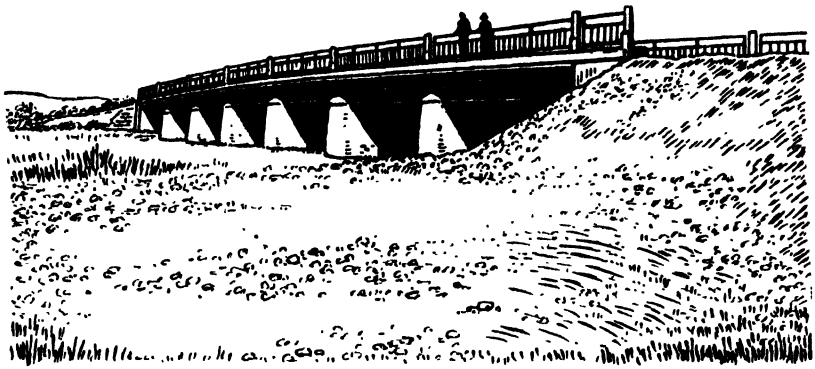


FIG. 93. *Karincadere bridge* (*No. 59*)

Bergama. It crosses the Altinova stream 3 miles south of the village of the same name by a reinforced concrete bridge (No. 60) of three spans (43+53+43 ft.) completed in 1938. At Dikili the road turns inland towards Bergama, to avoid the hills of the Kara Dağ promontory and the marshes of the lower Bakir river, but south again 5 miles from Bergama, crossing the Bakir river by a reinforced concrete bridge (No. 61) completed in 1931. Following the left bank of the Bakir, it reaches the coast at the head of Dema bay and crosses the Güzelhisar stream near its mouth by a bridge (No. 62), 132 yards long, to reach the coastal village of Aliağa, 4 miles farther south. Here again the road turns inland to cross a col at about 330 feet between the Şapane Dağ and the Dumanli Dağ (3,600 ft.), which brings it to the head of the Gediz delta. The river is crossed by a fine five-span reinforced concrete bowstring bridge (No. 63; fig. 94), 175 yards long, and the road reaches Menemen on the railway from Afyonkarahisar through Manisa to Izmir. From Menemen the road follows the railway round the western end of the Yamanlar Dağ (3,520 ft.), avoiding the marshes of the Gediz delta, then skirts the head of the Gulf of Izmir, where

it has to be embanked to avoid the floods, and turns sharply into Izmir (fig. 16, p. 84).

It is an all-weather metalled road, 16–23 feet wide, but with a rough surface. As far as Ayvalik it was in bad condition in 1941, but is being repaired. From Ayvalik to Izmir its condition is fairly good.

(21) *Dikili–Soma* (45 miles)

From Dikili to Kadriye village, this route is part of the coast road just described. It continues eastwards up the Bakir valley to Bergama and 5 miles farther on crosses the Bakir and follows the foothills of the



FIG. 94. *Menemen bridge* (*No. 63*)

Kiliç-Çamlica ridge to Soma, where it sends a short branch across the Bakir to the station on the Izmir–Balikesir railway. It is an all-weather motor-road, metalled, and believed to have been recently repaired (1941).

(22) *Foça–Helvaciköy* (15 miles)

This is the only made road connecting the coast with the Edremit–Izmir road, and it links the small port of Foça at the entrance to the Gulf of Izmir with Izmir and the Gediz valley routes, and therefore is important. It joins the Edremit–Izmir road 12 miles from Menemen, and sends off several short tracks to the anchorages of the Foça promontory. It is believed to be metalled and passable for wheels.

(23) *Menemen–Manisa* (20 miles)

This road connects the Edremit–Izmir road with Manisa, closely following the railway throughout, and keeping to the left bank of the Gediz river. Both make use of the Menemen defile between the Dumanli Dağ (3,600 ft.) and the Yamanlar Dağ (3,520 ft.). Near Emirâlem, at the west end of the defile, the Değirmen stream is crossed by a reinforced concrete girder bridge (Değirmendere, No. 64) with three spans and a total length of 66 yards, completed in 1938.

(24) *Izmir–Manisa* (30 miles)

A direct road from Izmir to Manisa short-circuits the railway and the road through Menemen by climbing over a col at above 4,000 feet between the Yamanlar Dağ and the Manisa Dağ. It is an all-weather motor-road, capable of taking two lines of traffic, but the first section, between Izmir and Burnuva (5 miles), is said to be in bad repair. A short branch from Burnuva leads back to the coast at the head of the Izmir gulf, joining the coast road at Bayrakli.

(25) *Manisa–Soma* (55 miles)

This road, metalled and in fair condition, is an all-weather motor-road parallel to the railway, except where it cuts across the eastward loop of the railway near Akhisar. It crosses the Gediz river at Manisa, follows the Kum tributary, and reaches the upper valley of the Bakir at Kirkağaç. A short branch from south of Kayişlar station goes north-east to Akhisar (10 miles). Another branch from Saruhanli station appears to be planned to reach Turgutlu, and the Kumçay bridge (No. 65) was completed in 1931.

(26) *Salihli–Gördes* (45 miles)

From the Izmir–Afyonkarahisar railway this road goes up the Gediz valley to Borlu and then climbs to over 3,200 feet to reach Gördes. It is said to be a motor-road 16 feet wide, and may be planned to reach Sindirği, thus linking Salihli with Balikesir.

(27) *Alaşehir–Kula* (18 miles)

This short road connects the Kula textile-mill with the Izmir–Afyonkarahisar railway at Alaşehir. It is a two-way all-weather motor-road in good condition.

(28) *Uşak–Kütahya* (65 miles)

From the Izmir–Afyonkarahisar railway at Uşak a motor-road in fairly good condition leads through Kocahan, Gediz, and Çavdar Hisar, and joins the Kütahya–Afyonkarahisar road (p. 455) 7 miles from Kütahya. For part of the way it uses the upper Gediz valley, with the Elma Dağ rising to nearly 6,000 feet on the east and the Koca Dağ to 4,800 feet on the west. The road then deteriorates, winding with hairpin bends over the hills until it reaches the more level plateau of the Örencik Ovasi. After crossing a rocky watershed it follows one of the Porsuk headstreams down to the Kütahya–

Afyonkarahisar road. The Uşak road was heavily used by the Greeks during the War of Independence (I, p. 318) and could undoubtedly be brought into first-class repair. There is a branch of 25 miles, metalled and fit for motors in dry weather, from Çavdar Hisar through Virancik (Örencik) to Emet, and another roughly metalled branch from Kocahan to Simav (25 miles).

(29) *Tavşanli–Kütahya* (30 miles)

A rough motor-road follows approximately the line of the Balikesir–Kütahya railway between Tavşanli and Kütahya, keeping to the north of the line. Bridges are still of wood, and can only take loads up to 3 tons.

There are no other roads of importance in the northern sector of Western Anatolia, but several cart-roads provide additional routes through the hills, and may eventually be improved.

Northern Sector: Summary

Points where the roads connect directly with the railways are summarized below:

Çanakkale Zone

Road (3) Balikesir, on the Bandirma–Manisa and Balikesir–Kütahya lines (Rlys. 15, 16).
(4) Balikesir.

Marmara Zone

Road (8) Bandirma and Siğirci on the Bandirma–Balikesir line (Rly. 15); Bursa, on the Bursa–Mudanya narrow-gauge line (Rly. 13); Bilecik Küplü (Yayla), and Karaköy, on the Haydarpaşa–Eskişehir line (Rly. 2).
(9) Mekece, Akhisar, and Geyve, on the Haydarpaşa–Eskişehir line (Rly. 2).
(10) Bursa on the Bursa–Mudanya line (Rly. 13); Izmit, on the Haydarpaşa–Eskişehir line (Rly. 2).
(12) Mudanya, Koru, Çekirge, and Bursa, on the Bursa–Mudanya line (Rly. 13).
(14) Bandirma, Siğirci, Ak Sakal, Okçugöl, Susurluk, Yeniköy, and Balikesir, on the Bandirma–Balikesir line (Rly. 15).
(16) Bursa.
(18) Balikesir, Çukurhüseyin, and Soğucak, on the Balikesir–Manisa line (Rly. 15).
(19) Balikesir.

Bergama Zone

Road (20) Menemen, Ulucak, Çiğli, Bayrakli, and Izmir, on the Izmir–Manisa line (Rly. 14).
(21) Soma, on the Balikesir–Manisa line (Rly. 15).
(23) Menemen, Emirâlem, Muradiye, Horozköy, and Manisa, on the Izmir–Manisa line (Rly. 14).
(24) Izmir and Manisa. Burnuva is on a small suburban line from Izmir (Rly. 14).
(25) Manisa, Saruhanli, Ishakçelebi, Kayişlar, Kapakli, Çiftlik, Akhisar, Harta, Kirkağaç, and Soma on the Balikesir–Manisa line (Rly. 15).
(26) Salihli, on the Izmir–Afyonkarahisar line (Rly. 14).
(27) Alaşehir, on the Izmir–Afyonkarahisar line.
(28) Uşak, on the Izmir–Afyonkarahisar line, and Kütahya on the Balikesir–Kütahya line (Rly. 16).
(29) Tavşanli, Köprüören, and Kütahya, on the Balikesir–Kütahya line.

Road Construction and Maintenance

The following list shows the approximate provincial responsibility for the upkeep of the various roads described above; roads are listed by vilâyets in the order in which they occur in the text:

Çanakkale Zone

Çanakkale: Kumkale–Lapseki (1); Çanakkale–Ilica (2); Çanakkale–Yenice (4); Karabiğa–Çan (5); Ezine–Çan (6).
Balikesir: Ilica–Balikesir (3); Yenice–Balikesir (4); Erdek–Gönan (7).

Marmara Zone

Balikesir: Bandirma–Balikesir (14); Balikesir–Soğucak (18); Balikesir–Sindirği (19).
Bursa: Bandirma–Yenişehir (8); Inegöl–Mekece (9); Bursa–Yalova (10); Tirilye–Karaağaç (11); Mudanya–Bursa and Tirilye–Mudanya (12); Gemlik–Yenişehir and Iznik (13); Karacabey–Göbel (15); Bursa–Orhaneli (16); Inegöl–Domaniç (17).
Bilecik: Yenişehir–Bilecik, Inegöl–Karaköy, Karaköy–Bilecik (8).
Kocaeli: Mekece–Geyve (9); Yalova–Izmit and Karamürsel–Mamuriye (10).

Bergama Zone

Balikesir: Edremit–Altinova (20).
Izmir: Altinova–Izmir (20); Dikili–Soma (21); Foça–Helvaciköy (22); Menemen–Manisa (23); Izmir–Manisa (24).

Manisa: Manisa–Soma (25); Salihli–Gördes (26); Alaşehir–Kula (27).

Kütahya: Uşak–Kütahya, Çavdar Hisar–Emet, Kocahan–Simav (28); Tavşanli–Kütahya (29).

The Southern Sector

The road network of the southern sector is dependent, as stated above, on the railways from Izmir by the Gediz and Büyük Menderes valleys and on the motor-road from Antalya, which all meet at Afyonkarahisar. This dependence on a few main routes is even more marked than farther north because of the difficulties of cross-country movement, especially in the extreme south. The sector faces the Dodecanese. Military requirements for defence against attack from this direction have been dominant factors in recent road-planning, and construction has been intensified accordingly.

Except where roads running inland from the coast to the interior pass for short distances close to the shore of promontories, there are no motor-roads within 20 miles of the coast between Izmir and Muğla, and even from here onwards to Andifli the nearest road to the sea is several miles inland. The coastal section opposite the Dodecanese is therefore served by the main road from Izmir through Muğla to Fethiye. From it, branches reach out to small ports and strategic points on Aegean bays or promontories.

Inland of the Izmir–Fethiye road the country is difficult to penetrate except by the Gediz and the Küçük and Büyük Menderes valleys. The first of these has a railway as far as Salihli, whence it is continued up the Koca to Alaşehir; the second has a railway as far as Ödemiş, but there is no motor-road out of the valley beyond this town, unless the branch across the Boz Dağ to Salihli has been completed. A short stretch of road from Ödemiş to Adagide, with a three-span bridge over the Küçük Menderes (No. 66) completed in 1925, is reported fit for motors, but no details are available.

Up the Büyük Menderes valley also the railway between Aydin and Sarayköy has supplanted the old road, which has never been properly reconstructed, though it is reported passable for light motors except after rain.

A second important lateral road, parallel to that from Aydin to Fethiye, is that from Alaşehir through Sarayköy to Antalya. Its importance rests on the fact that when the gap between Alaşehir and Salihli is closed, it will link Izmir by road with the Mediterranean coast at Antalya. It already connects the railways in the Gediz and

Büyük Menderes valleys, gathers the ends of the routes inland from Muğla, Köyceğiz, Fethiye, and Finike, and sends branches to the old British-built railway at Dinar and Eğridir, and to the modern branch-lines at Burdur and Isparta.

Main Lateral Road and Seaward Branches

(1) *Izmir–Fethiye* (225 miles)

This major trunk road is nearing completion, though sections of it are still passable only in dry weather. From Izmir it follows the Izmir–Aydin railway southwards to Seydiköy, then turns south-east to Torbali, where the branch line to Ödemiş leaves the main line. It then crosses the marshy valley of the Küçük Menderes and follows the southern edge to Tire. To this town the road is metalled, though liable in places to be flooded in winter, when the Küçük Menderes frequently overflows its banks. From Tire the road turns south and climbs steeply to over 3,300 feet to cross the Messogis range (I, p. 136) to Aydin in the Büyük Menderes valley; this section is still an earthen track, passable only in dry weather, unless it has recently been improved. Near Aydin several small tributaries of the Büyük Menderes have to be forded, but the Büyük Menderes itself is crossed by a new ferro-concrete bridge. The road penetrates the rugged highlands of south-west Anatolia by the Çine valley which leads to the cultivated plain of Muğla. A fairly easy pass takes it to the Namnam valley, where the Namnam bridge (No. 73) was completed in 1939, and to the lake and town of Köyceğiz; then it crosses some low hills, where chromite is mined, to the Dalaman valley near Ak Kaya. The Dalaman bridge (No. 74), completed in 1936, is the essential link between Muğla and Fethiye, the outlet for the chromite mines in the hinterland, for the Dalaman valley is deep and the countryside badly drained; the road itself may easily become impassable with continuous traffic because of the heavy winter rainfall (44 in. at Muğla from October to March). The bridge, of reinforced concrete and bowstring design (fig. 96), has three 115-foot spans and is 117 yards long. The spans are wide to allow timber to be floated down when the river is in flood. Work has been in progress between the Dalaman bridge and Fethiye since 1938, and it is proposed to continue the road through Kemer and down the Koca valley to the small harbour of Andifli, facing the Dodecanese island of Castelrosso (Castellorizo; *Turk.* Meis). As far as Kemer it is reported passable for motors in all weather. A few timber bridges may still remain on this road, but most have been

replaced by steel or concrete ones (e.g. Nos. 67, 68, on the Aydin–Çine section).

(2) On the seaward side of this road, several branches lead to the coast, and several short roads lead inland, but do not reach the main road. These are as follows:

(*a*) *Izmir to Karaburun* (55 miles), *Çeşme* (52 miles), and *Siğacik* (30 miles). From Izmir a good motor-road follows the southern shore of the Gulf of Izmir to Klazümen (Urla Iskelesi), the landing-place



FIG. 96. *Dalaman bridge* (*No. 74*)

for Urla. It crosses a number of short streams by stone and metal bridges, and since it is closely hemmed in by the sea to the north and steep hills to the south, it is liable to damage from sea erosion or storm water from the hills. About 15 miles west of Izmir a branch leaves the road and turns south up the Çamli valley, crossing the watershed of the Erythraean promontory at over 330 feet to Seferihisar, where it turns west to Siğacik harbour, a 'backdoor' entrance of great importance to Izmir (I, pp. 82–4). The Klazümen road turns inland to Urla but reaches the coast again at the head of the Çarpan gulf and follows the western shore of the Gulf of Izmir to Karaburun (Ahirli) at the western entrance. The Çeşme road branches west from the Çarpan gulf, across the rough moors of the Koca Dağ to Alaçati, the centre of a small well-watered plain. Reaching the coast at Ilica, it skirts Boyalik bay to Çeşme on the Khios strait. The road from Izmir to Çeşme is in good condition throughout, but the branch to Siğacik, though metalled, is bad, and affected by floods in the Çamli valley. The

branch to Karaburun is a military road believed to be fit for heavy traffic.

(*b*) *Subaşi–Kuşadasi* (25 miles). This road is designed to link the small port of Kuşadasi with Torbali, but only the section not served by the railway is completed. This, from Selçuk to Kuşadasi, is in fairly good condition, and work is reported to be proceeding on the section between Subaşi on the Izmir–Fethiye road and Selçuk.

(*c*) *Aydin–Kuşadasi* (45 miles). Along the northern edge of the Büyük Menderes valley a road runs parallel with the Izmir–Aydin railway to Pinarbaşi (Ortakler), then follows the branch line from here to its terminus at Söke. From Söke it makes use of a low col between the Samsun Dağ and the Gümüş Dağ to reach Kuşadasi. Only the latter section, away from the railway, is completed, but the rest is reported passable except in very bad weather.

(*d*) *Ahiköy–Bodrum* (61 miles). From Ahiköy, on the Izmir–Fethiye road, near the head of the Çine valley, a road branches west through a pass over 2,500 feet above sea-level between the Kurukömes Dağ and the Koca Dağ. About 20 miles from Ahiköy a short branch forks north to Milas, the main road continuing across the marshy Değirmendere plain to the shore of the Mandalya gulf, where Küllük provides an outlet for the emery mined in the interior. Before reaching Küllük the road forks south-west between the Asar Dağ and the sea, and winds over the hills to Bodrum, another small port, on the shores of the Gulf of Kerme. Although it is said to be an all-weather road, 16 to 23 feet wide, it is liable to flooding, particularly near Küllük.

(*e*) *Muğla–Reşadiye* (70 miles). About 9 miles south of Muğla, on the Izmir–Fethiye road, a branch crosses the eastern end of the Kiran Dağ to reach the coast at Iskele, the landing-place at the head of the Gulf of Kerme (I, p. 89). The road then traverses the marshy ground at the head of the gulf and crosses the Kara Dağ to the port of Marmaris, whose land-locked harbour faces the Dodecanese island of Rhodes. From Marmaris the road turns west along the narrow Reşadiye peninsula to the village of Reşadiye (Datça) in its western hills. As far as Marmaris it is an all-weather road with reinforced concrete bridges and a width of 13–16 feet. From Marmaris to Reşadiye it is a newly constructed earthen road.

Inner Lateral Road and its Branches

(3) *İzmir–Kemalpaşa–Turgutlu–Salihli* (62 miles)

This is part of the trunk road, which, when completed, will link Izmir with Antalya, in an arc enclosing the south-western coast and

its hinterland. At present there is a gap between Salihli and Alaşehir, except for a cart-track and the railway.

From Izmir the road goes east, between the Manisa Dağ and the Kemalpaşa Dağ, then, after crossing a number of tributaries of the Kemalpaşa (Nif) river, it turns north to Turgutlu (Kasaba) on the southern edge of the Gediz plain. Turning east up the Gediz valley, the road passes through Ahmetli and by the site of ancient Sardis, to Salihli, where it degenerates to a cart-track impassable in winter. As far as Salihli it is an all-weather road, about 23 feet wide, with bridges of stone or timber capable of taking loads up to 14 tons. There is as yet no connexion by motor-road between Manisa and this route at Turgutlu.

(4) *Alaşehir–Antalya* (175 miles)

There is no reliable information about the condition of this second section of the inner trunk road. Some reports state that it has been reconstructed throughout and is fit for light motor-traffic in all weather, but it is more probable that in the mountains the road is difficult at all times and impassable in wet weather.

From Alaşehir the road follows the Koca–Gediz valley through Inegöl, crossing the Derbent tributary by a stone bridge. Climbing the eastern end of the Messogis range, it keeps below 2,500 feet and sends a short branch to Boldan, then descends to Sarayköy, crossing the Büyük Menderes by a three-span concrete bridge (No. 71), 87 yards long, completed in 1927. Here it joins the Aydin–Afyonkarahisar railway and passes up the Emir valley to Denizli, on the north slopes of the Tavas plateau. From Denizli it surmounts a spur of the Honaz Dağ at over 4,000 feet, and drops to the marshy upland basin of Acipayam. To this point it is believed to be metalled or macadamized.

From Acipayam the road, now probably an earthen track, crosses the Eşler Dağ to the populous Tefenni plain, where a section has been metalled from Karamanli. The next section south-eastwards through the mountains of the western Taurus to Korkuteli (3,350 ft.) is again unmetalled, but from here onwards the road across the third range of the western Taurus (I, p. 147), though difficult and winding, has been metalled down to the coast at Antalya. The Marziman timber bridge, east of Korkuteli, was repaired in 1941.

(5) From this trunk road a few branches penetrate the highlands and link it either with the Izmir–Fethiye road or directly with the south coast.

(*a*) *Sarayköy–Aydin* (65 miles). This is an earth road, believed to

be fit for motors except in wet weather. It keeps parallel to the railway, and where it lies close to the Büyük Menderes between Yeniköy and Nazilli it suffers from wash-outs when the river is in flood. Two branches, fit for motors, connect Karacasu and Bozdoğan with the railway at Kuyucak and Nazilli. The second of these, from Nazilli to Bozdoğan, crosses the Büyük Menderes by the Nazilli bridge (No. 69) which was completed in 1931 and has a length of 79 yards, and the Ak Çay by another bridge (No. 70), 191 yards long, which was opened in 1928.

(*b*) *Denizli–Muğla* (60 miles). This road across the Tavas plateau was completed only as far as 15 miles south of Tavas in 1940, when work was proceeding beyond this point. The Akçay bridge (No. 72) over the Ak Çay in its course through the Tavas Ovasi was under construction in 1940, and is believed to be completed. It has six spans and a total length of 120 yards, with a roadway 18 feet wide. The Diphan and Muratlar bridges, between Denizli and Tavas, are also believed to be under construction, but no details are available.

(*c*) *Acipayam–Köyceğiz* (55 miles). Work has been in progress on this road for some years, but it is not known whether it is yet fit for motors. It has a difficult mountain course throughout, along the Dalaman–Büyük Menderes watershed.

(*d*) *Tefenni–Fethiye* (70 miles). This is a stone-built all-weather road through Çavdir and Kemer, where it joins the continuation of the Izmir–Fethiye road (p. 430).

(*e*) *Korkuteli–Finike* (60 miles). This road, 16–23 feet wide, is reported to be an all-weather route. It lies between the second and third of the western Taurus ranges for most of its course, passing Elmali and its surrounding lakes, and making use of the Yaşgöz valley to break through the Bey Dağ and descend to the coast at Finike, one of the minor ports of the Mediterranean coast.

(6) A few branches from the Alaşehir–Antalya road link up with the railways on the Central Plateau.

(*a*) *Denizli–Dinar* (70 miles). This road follows the Aydin–Afyonkarahisar railway closely up the valley of the Emir Çay, one of the Büyük Menderes headstreams, then round the north-west shore of Lake Acigöl as far as Dazkiri, where it leaves the railway to run direct to Dinar over low, undulating hills. It is metalled only as far as Kaklik, but beyond that it is a good earthen track; a bridge was reported under construction at Dazkiri in 1941. A good metalled road branches off at Kaklik, and at Ayvacik forks again to Çal and

up the Baklan Ovasi to Çivril, the terminus of a branch line from the Aydin–Afyonkarahisar railway. The Çal road is metalled and in good condition, and two wooden bridges were replaced by reinforced concrete ones in 1939. The Çivril road, from Ayvacik, is still only fit for pack animals.

(*b*) *Karamanli–Burdur* (40 miles). A stone-built road, said to be fit for motor traffic in all weathers, leaves the Alaşehir–Antalya road at Karamanli and goes north-east, between the first and second ranges of the western Taurus, through Hacilar and along the south-east side of Lake Burdur to Burdur town, where it connects with the Antalya–Burdur road (p. 437) and with a branch of the Dinar–Eğridir railway.

Southern Sector: Summary

Points where the roads connect directly with the railway (Rlys. 14, 17) are summarized below:

Road (1) Izmir, Torbali, between Izmir and Aydin, and Seydiköy on a small suburban branch; Tire, the terminus of the Torbali–Ödemiş branch-line; Aydin.
(2 *a*) Izmir.
(2 *b*) Kozpinar, Selçuk, between Izmir and Aydin.
(2 *c*) Aydin, Incirliova (Karapinar), Erbeyli, Germencik, Ortakler (Pinarbaşi), between Aydin and Izmir; Morali, Sökekemeri, Söke, on the Söke branch-line.
(3) Izmir, Turgutlu, Ahmetli, Salihli, between Izmir and Alaşehir.
(4) Alaşehir, on the Izmir–Afyonkarahisar line (Rly. 14); Sarayköy, Bucali, on the Aydin–Afyonkarahisar line (Rly. 17).
(5) Sarayköy, Burhaniye, Horsunlu, Kuyucak, Nazilli, Atça, Sultanhisar, Köşk, Umurlu, Aydin, on the line between Sarayköy and Aydin.
(6 *a*) Böceli (Bucali), Kocabaş, Bozkurt (Hamidiye), Çardak, Tazkiri (Dazkiri), Dinar, on the Aydin–Afyonkarahisar line; Çivril, the terminus of a branch-line from Sütlâç.
(6 *b*) Burdur.

Road Construction and Maintenance

The following list shows the approximate provincial responsibility for the upkeep of the various roads described above; roads are listed by vilâyets in the order in which they occur in the text:

Izmir: Izmir–Tire (1); Izmir–Karaburun, Izmir–Çeşme, Izmir–Siğacik (2 *a*); Subaşi–Kuşadasi (2 *b*); Söke–Kuşadasi (2 *c*); Izmir–Turgutlu (3).
Manisa: Turgutlu–Salihli (3); Alaşehir–Inegöl (4).

Aydin: Tire–Ahiköy; Aydin–Söke (2 *c*); Sarayköy–Aydin, Kuyucak–Karacasu, Nazilli–Bozdoğan (5 *a*).

Denizli: Inegöl–Acipayam (4); Denizli–Kale (5 *b*); Acipayam–Karadut (5 *c*); Denizli–Kaklik, Kaklik–Çal, Ayvacik–Çivril (6 *a*).

Muğla: Ahiköy–Fethiye (1); Ahiköy–Bodrum (2 *d*); Muğla–Reşadiye (2 *e*); Kale–Muğla (5 *b*); Karadut–Köyceğiz (5 *c*); Dirmi–Fethiye (5 *d*).

Antalya: Tefenni–Antalya (4); Korkuteli–Finike (5 *e*).

Burdur: Acipayam–Tefenni (4); Tefenni–Dirmi (5 *d*); Karamanli–Burdur (6 *b*).

Afyonkarahisar: Kaklik–Dinar (6 *a*).

IV. THE SOUTHERN COASTLANDS

THE coast and topography of the Southern Coastlands have been described in vol. I, pp. 91–102 and 142–59. Between the Antalya lowland and the Seyhan plain the mountains of the western Taurus lie parallel to the coastline between Alanya and Anamur, but are truncated by coastal cliffs between Anamur and the mouth of the Gök Su near Silifke. East of Silifke the trend of the main Taurus is again parallel to the coastline, but there is only a very narrow coastal plain until Mersin is reached, when the lowland begins to broaden to form the Seyhan plain, which in turn is shut in by the mountains of Anti-Taurus.

North of the Taurus the old 'Anatolian' and 'Baghdad' railways follow the depression along the southern edge of the Central Plateau (p. 294). At Karaman the railway changes direction, conforming with the Taurus strike, until it finds a practicable passage by the Ulukişla gap and the Çakit gorge to the Seyhan lowland. A road, famous in history, follows the railway throughout, and the two are never far from each other. At different periods the road has been fully metalled, but though repaired and improved during the war of 1914–18 to supplement the railway, it was heavily overworked, and has never since been fully reconstructed. With the modern policy of communications, its functions have been largely taken over by the railway, and much of the Taurus traffic is diverted through Ankara, Boğazköprü, and Ulukişla (p. 254).

Another ancient route, for a few months of the year physically easier than that through the Cilician Gates, followed the natural break between the main Taurus and western Taurus from Karaman to Silifke. Two roads now make use of it.

In the past, routes from Kayseri to the Seyhan plain ran south-westwards through Elbistan, Göksun, and Saimbeyli, but have long since fallen into disrepair.

The purpose of road communications in the Southern Coastlands is now mainly economic rather than strategic: to develop the agricultural possibilities of the two lowlands and the minerals of the mountains, to transport the products back to the central plateau, and to develop the ports of Antalya, Mersin, and Iskenderon. This necessitates transit roads from the lowlands to the plateau railway, with feeder roads to places of economic importance. Roads are therefore centred on Antalya in the west and on the Seyhan plain in the east, and in any future expansion these two lowlands must remain focal areas; for the barrier of the Taurus and the absence of coastal plain preclude any great development of roads in the central region. There is, however, a third region which is growing in importance. With the construction of the Fevzipaşa railway to Malatya and the improvement of roads beyond the Gâvur Dağ, the prospects of developing south-east Turkey are increasing.

The Antalya Sector

(1) *Antalya–Alanya* (85 miles)

An all-weather water-bound macadamized road, fit for 10-ton lorries, goes east from Antalya through Serik to Manavgat, crossing the Ak Su (Koca) 13 miles from Antalya by a modern reinforced concrete bridge (No. 75) completed in 1933. The Manavgat Çay is also spanned at Manavgat by a shorter bridge (No. 76) which was opened a year earlier. Several small streams are crossed in the narrow coastal plain by bridges of stone or concrete. Work has been in progress since 1938 on an extension of the road along the confined coastal plain to Alanya, though it is not certain whether this has yet been completed for motor traffic.

No coastal road has yet been constructed either west of Antalya or east of Alanya. There is no natural route along the coast between Anamur and Silifke, and though a projected motor-road linking these two places is shown on some maps, its construction must entail great difficulty.

(2) *Antalya–Burdur* (75 miles)

(3) *Antalya–Isparta* (70 miles)

The most important road inland in this sector is the main motor-road from Antalya to Burdur with a new road-connexion to Isparta,

both places being on branch lines from the railway between Dinar and Eğridir (Rly. 18). Motor-buses follow both routes.

The main road leaves the Antalya–Alaşehir road (p. 433) 6 miles north-west of Antalya, and uses the Kizilkaya pass and the upland basin of Lake Kestel to reach Bucak at about 2,900 feet. Beyond Bucak the road forks, the Burdur road climbing sharply over the Koru Dağ at about 2,800 feet and the Iğdiçkir Dağ above 4,000 feet. It is about 16 feet wide, and of water-bound macadam. Details of the Isparta road are not available.

In addition to the railway connexions, Burdur and Isparta are joined to Dinar by dry-weather roads through Baladiz, suitable for light motor-traffic.

(4) *Isparta–Eğridir–Akşehir* (80 miles)

A metalled road connects Isparta with the railway terminus at Eğridir, and then continues round the southern and along the eastern shore of Lake Eğridir; passing through Hüyük and Örkenez, it crosses the Sultan Dağ before reaching Akşehir on the old Anatolian railway, 108 miles from Konya. Construction has been in progress for some years, but it is uncertain whether work is finished. Posts for the regular inspection and repair of roads have been established.

(5) *Manavgat–Konya* (150 miles)

The only other important road in this sector leads inland from Manavgat. It was completed in 1940, and though no details are available, it is believed to be an all-weather motor-road. Its alinement is not yet shown on maps, but it is thought to pass through Akseki, Seydişehir, and Beyşehir, and to take the Sariöz gap in the Sultan Dağ past Kizilviran. A branch from Beyşehir along the north-east shore of Lake Beyşehir to Örkenez on the Baladiz–Akşehir road is under construction.

(6) *Anamur–Ermenek* (40 miles)

An old road leads inland from Anamur to Ermenek, crossing the Görmeli (? Gök Su) by a fine old masonry bridge (fig. 98) 10 miles from Ermenek. Motors have been seen on this bridge, but it is believed that the road is not fit for wheels throughout, even in dry weather. Road reconstruction and repair in the Içel vilâyet is, in fact, mostly concentrated on improving roads in the Taurus for pack animals. Up to 1940, no steps had been taken to construct a motor-road up the Gök valley, though there is a project to link Silifke, Mut, Ermenek, and Alanya along the fault-valley of the southern Gök Su.

Antalya Sector: Summary

Points where the roads connect directly with the railway (Rlys. 9, 18) are summarized below:

Road (2) Burdur (Rly. 18).
(3) Isparta, Baladiz, and Dinar (Rly. 18).
(4) Isparta, Kuleönü, Eğridir (Rly. 18), Akşehir (Rly. 9).
(5) Konya (Rly. 9).



FIG. 98. *Old Görmeli bridge, Ermenek–Anamur road*

Approximate provincial responsibility for road construction and maintenance is as follows; roads are listed by vilâyets in the order in which they occur in the text:

Antalya:	Antalya–Alanya (1); Antalya–Kizilkaya (2 and 3); Manavgat–Akseki (5).
Burdur:	Kizilkaya–Baladiz (2); Kizilkaya–Isparta (3).
Isparta:	Isparta–Örkenez (4).
Konya:	Örkenez–Akşehir (4); Akseki–Konya (5); Kazanci–Ermenek (6).
Içel:	Anamur–Kazanci (6).

THE ADANA SECTOR

The Adana sector of the Southern Coastlands includes the Seyhan lowland, the main Taurus, Anti-Taurus, and Gâvur ranges. Considering its economic importance, the Seyhan lowland is not well

supplied with good roads; most of those in existence were forerunners of the 'Baghdad railway' and of the Mersin–Adana line, and many have fallen into disrepair and have not been remade.

Adana is the chief town of the Seyhan lowland, and on it converge a number of roads from the coast, from the Taurus, and from Anti-Taurus. It lies also on the old Baghdad railway and has an important line to the port of Mersin (p. 338).

The Seyhan river is a considerable obstacle to traffic from west to east. Its breadth and depth vary with the season. In August 1903 its average depth at Adana was about 4 feet; in the shallowest part it was only 2 feet, in the deepest from 8 to 12 feet, the current being about 3 miles an hour. The bottom is gravelly and firm, and fairly free from mud, but the river is unfordable and liable to flood, though this danger has probably been much reduced by river-training and irrigation works recently carried out (p. 160). The Seyhan is spanned at Adana by a railway bridge (p. 300) and by a fine old Roman road-bridge (p. 444). Below Adana there are six ferries: at Adali, Yamanli, Salmanbeli, Kyafeli, Ziyamet, and Tabaklar.

The Ceyhan river is navigable as far as Misis, and has depths of 12–16 feet near the mouth, where it is 80 yards wide. At Ceyhan, where a bridge is being built, it is about 220 yards wide. There is a road bridge at Misis (p. 444) and a railway bridge near Sirkeli (p. 300). The seven ferries below Ceyhan town are at Ceyhan, Abdioğlu, Büyük Kapili, Çapar Dede, Yagşi near Akdam, Kesme Burnu near Eğriağaç, and Bebeli.

The Tarsus river is about 150 feet wide and 12 feet deep at its mouth, and 270 feet wide at Kelahmet, 9 miles from the mouth. It is bridged at Tarsus by a steel girder railway bridge (p. 339) and by a stone road-bridge (p. 441). There are ferries at Karafaki and Kelahmet.

The Gâvur Dağ forms an obstacle to all roads eastwards from the Seyhan lowland and the Gulf of Iskenderon. There are two gaps east of Osmaniye, taken by the road and railway from Adana to Fevzipaşa, and a third, the Beilan pass, which takes the road from Iskenderon to Antakya. At Fevzipaşa and Antakya more new roads have been made and will be described in the Eastern Sector (pp. 446–51).

(7) *Mersin–Silifke* (57 miles)

This new 16-foot all-weather road, surfaced with water-bound macadam, is hemmed in between the steep coastal slopes of the main Taurus and the sea. It crosses many streams which may be dry in

summer and autumn, though winter rains and spring thaws swell them to torrents at other times in the year. All these streams are bridged near their mouths, and the road is kept in good repair throughout; it is used by a regular bus service. An extension has been made from Silifke to the village of Taşucu, which has a landing-jetty at the head of its bay (p. 108).

There is no direct road for wheels between Silifke and Anamur, near the eastern end of the Gulf of Antalya. The two places are, however, linked by a winding track over the hills, about 100 miles long, which in places is fit for carts in fine weather. It passes through Gökbelen, Gülnar, and Gilindire.

(8) *Mersin–Adana* (45 miles)

The road from Mersin through Tarsus to Adana was until recently only a dry-weather track with a bad surface. It is now surfaced with water-bound macadam, 16 feet wide, with a verge 6½ feet wide for horse traffic, also used by cars in summer. Special attention has been directed to those sections of the road which used to become impassable from mud in winter, and with the better control of the Seyhan, Tarsus, and other Taurus streams, upkeep should be less difficult than in the past. There is one new bridge (No. 77) on this road, over the Keloğlu (? Kusun) river between Tarsus and Adana. The Tarsus river is spanned by a stone bridge 96 yards long with three arches.

The historic road to the plateau leaves this road at Tarsus, and is described below. With the exception of two roads of doubtful condition leading inland from Silifke, it is the only road fit for wheels across the main Taurus, but some of its former importance has now been surrendered to the railway.

(9) *Tarsus–Ulukişla* (77 miles)

The road to the Central Plateau leaves the Adana–Mersin road, east of the stone bridge over the Tarsus river, and crosses the Mersin–Adana railway just west of Külekboğazi station. It then keeps a few miles east of the Tarsus river, but joins the Yeşiloluk tributary at Çiftlikköy. In the next 12 miles the road follows this river through the famous defile of Külek Boğazi, the historic 'Cilician Gates' (I, photos. 68, 70, p. 152), flanked at the western entrance by the fortress of Külek Kale (1,500 ft.). In its passage through the defile the road crosses the stream five times on stone bridges, and then emerges on the open, stony Tekir plateau at 4,350 feet, whence it descends into the fir-clad Çakit gorge to meet the 'Baghdad railway' at Pozanti

(2,550 ft.). With the railway it follows the Çakit valley through the Taurus to Ulukişla (4,680 ft.) on the western slopes, receiving a short branch from the silver-lead mines of Bulgarmadeni. Before reaching Ulukişla, it is joined from the north by the main road from Ankara and Kayseri through Niğde.

The road was reconstructed and metalled throughout for heavy lorry traffic during the war of 1914–18. Except for the first 12 miles it has been reconstructed since 1923, though as far as Pozanti it is very rough and liable to be temporarily blocked by snow and by landslips, especially from October to May; when open it will take light lorries in all weather. Landslips are particularly dangerous near Haydarbeli Han, 5 miles from Pozanti. In places the road is revetted by dry-stone supporting walls, and similarly protected against rock-falls. Some of the bridges, which are both of stone and of timber, were said to be able to support loads only up to 3 tons. In 1942 it was reported that the Ministry of Public Works has converted the whole road into an asphalted road, 20 feet wide, fit for heavy military traffic.

(10) *Silifke–Mut–Karaman* (103 miles)

This difficult road, through rugged limestone and sandstone country much dissected by precipitous gorges, and sparsely peopled, provides another route through the Taurus. It follows the Gök valley for about 50 miles, crossing the river by a ferry 10 miles west of Silifke, to Mut, where it traverses the side of the Avlama Dağ (6,200 ft.) for 20 miles. Striking north over the western flank of the range, it descends gradually to Karaman, on the southernmost part of the Central Plateau. It is said to be a metalled road, except between the point where it crosses the Avlama Dağ and about 7 miles from Karaman, but snow and rain close the road to traffic between Mut and Karaman for eight months from November to June. Bridges are mostly of stone or concrete. It is not known whether any recent reconstruction work has been done on it.

(11) *Silifke–Ayaş–Karaman* (99 miles)

This is a slightly shorter road than the more westerly one. It is said to be metalled almost throughout, but the surface is bad in many places. From Silifke it goes north, keeping below 4,500 feet, to Ayaş (Mağara). Thence it follows the watershed between the Gök and the Lamas, crosses the Taurus at about 5,000 feet, and descends to Kara-

man. At any time between December and March it may be blocked by snow. No details of any recent work on it are known.

Between Mersin and the Gulf of Iskenderon a few roads lead inland from the coast. None are good, and all are liable to become impassable from mud in wet weather.

(12) *Tuzla (Merkez)–Adana* (30 miles)

From Tuzla, at the eastern end of the small Tuz Göl lagoon, a road leads through Ziyamet and by the left bank of the Seyhan river to Adana. It is probably unmetalled, but passable for light motor-traffic in dry weather.

(13) *Karataş–Adana* (28 miles)

From Karataş, a summer anchorage and seaside resort at the entrance to the Gulf of Iskenderon, a roughly metalled dry-weather track leads northwards over the plain between the lower Seyhan and Ceyhan rivers.

(14) *Karataş–Tarsus* (40 miles)

A road, passable for cars in summer, leads inland from Karataş along the north side of the Ak Yatan lagoon to Ziyamet, where it crosses the Merkez–Adana road. It crosses the Seyhan and the Tarsus rivers by the Tabaklar and Kelahmet ferries, joining the Adana–Mersin road at Tarsus.

(15) *Karataş–Ayaş–Kurtkulak–Ceyhan* (58 miles)

Much of this road is unmetalled, and it is hardly passable for wheels even in fine weather. It crosses the Ceyhan by the Bebeli ferry, and follows the coast of Yumurtalik bay to the small port of Ayaş (Yumurtalik). Running along the northern side of the Gulf of Iskenderon, it is separated from the coast by low hills, and at the head of the gulf turns sharply westward to Kurtkulak, before bending north-west to Ceyhan.

Some recent work appears to have been done on two roads north of Adana, one to Karaisali, the other to Kozan. Some has also been carried out between Kozan and Feke, but no details are available. Farther north in the Anti-Taurus there are certainly no motor-roads, and very few tracks fit even for country carts.

(16) *Adana–Karaisali* (25 miles)

It is not known whether this route is fit for motors, but the completion in 1934 of a new reinforced concrete bridge (No. 78; fig. 99) over the wide Körkün (Gürgün) tributary of the Çakit, with a single span of 238 feet and a 12-foot roadway, points to a projected motor-road. Metalling has been started near Adana, and eventually the road may be continued beyond Karaisali. A bridge over the Çakit is projected, and may be under construction, but no details are available.

(17) *Adana–Kozan* (45 miles)

From Adana a road leads north-east to Kozan, at the southern edge

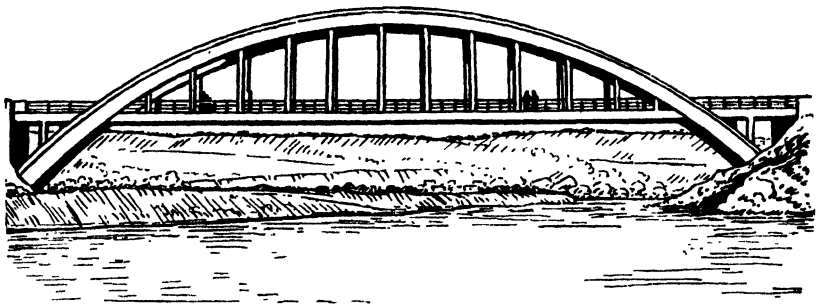


FIG. 99. *Körkün bridge* (*No. 78*)

of the Anti-Taurus (I, p. 155). It is known to be passable for wheeled traffic, but no other details are available.

(18) *Adana–Fevzipaşa* (80 miles)

East of Adana, the road through Misis, Ceyhan, Toprakkale (Kaleköy), and Osmaniye to Fevzipaşa, across the Gâvur Dağ, no longer provides an all-weather through route for wheeled traffic. As far as Toprakkale it has degenerated from a metalled road to an earthen track, with brick and stone culverts, and it is only fit for light lorries in dry weather. The ancient Seyhan bridge (fig. 100) at Adana, 220 yards long, is of stone, with twelve major and nine minor arches, a cobbled roadway 14–22 feet wide, raised foot-paths about 3 feet wide, and masonry parapets. It slopes gently at either end and has sunk slightly in the middle, but it is built very strongly, and has been ascribed to Hadrian or Justinian. The Misis bridge over the Ceyhan river is also of stone, with nine arches and a cobbled roadway 16 feet wide, and parapets. A new bridge (No. 79) of four spans (49+262+2×72 ft.) was under construction in 1941 over the Ceyhan at Ceyhan

town, to complete communications with the farming population on the right bank. The concrete piers and iron superstructure were completed, and the remainder put up for tender.

Beyond Toprakkale the road has been metalled, and provides an all-weather route to Fevzipaşa. It diverges slightly from the railway between Osmaniye and Mamure station, but closes in again near Yarbaşi. Here it diverges again, and, taking a shorter route than the railway, climbs steeply over the Gâvur Dağ by the Hasanbeyli pass

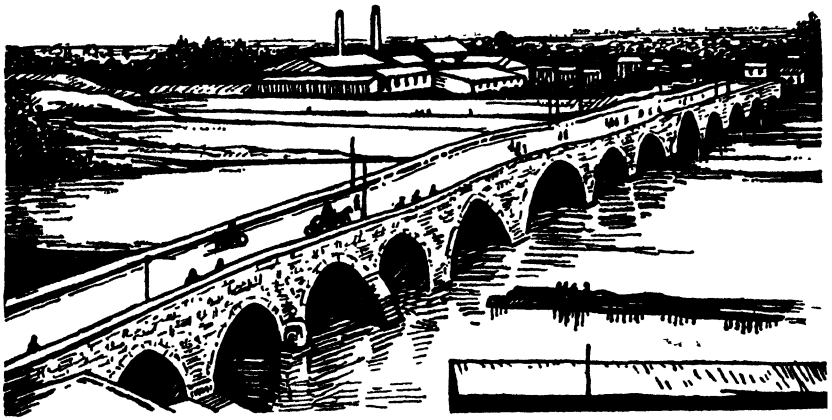


FIG. 100. *Roman bridge over the Seyhan at Adana*

(4,000 ft.) and winds down to Fevzipaşa (2,000 ft.), the junction of the new line to Malatya and Diyarbekir with the old Baghdad railway.

(19) *Toprakkale–Payas–Iskenderon* (40 miles)

The road between Toprakkale and Payas through the 'Amanus Gates', Erzin, and Dörtyol, though originally metalled, was in complete disrepair and in places washed away when the Hatay became Turkish in 1939. Beyond Payas it is metalled and in good condition, but badly bridged. An old Roman bridge of two spans is used to cross the Payas river, immediately south of Payas. Before the transfer of the Hatay to Turkey, Payas was a small port and frontier town, but its functions as a port have now been taken over by Iskenderon, 13 miles to the south, and it has no facilities for dealing with cargo.

(20) *Iskenderon–Antakya* (*Antioch*) (40 miles)

South of Iskenderon a good motor-road leaves the coastal plain near Karaağaç village and climbs past Beilan village (1,410 ft.) over the

Gâvur Dağ by the Beilan pass (2,250 ft.). It descends to the plain north of Lake Amik and turns south-west to Antakya.

Adana Sector: Summary

Points where the roads connect directly with the old Baghdad railway or the Mersin–Adana line (Rlys. 9, 19, 20) are summarized below:

Road (7) Mersin.
(8) Mersin, Karacailyas, Hacitalip, Tarsus, Külekboğazi (Rly. 19); Yenice, Kâhyaoğlu (Yeşilova), Şakirpaşa, Adana (Rly. 9).
(9) Tarsus, Külekboğazi (Rly. 19); Pozanti, Çiftehan, Ulukişla (Rly. 9).
(10) Karaman.
(11) Karaman.
(12) Adana.
(13) Adana.
(14) Tarsus.
(15) Ceyhan.
(16) Adana.
(17) Adana.
(18) Adana, Incirlik, Kürkçüler, Misis, Ceyhan, Veysiye, Mustafabey (Mustafapaşa), Toprakkale (Kaleköy), Osmaniye, Yarbaşi, Fevzipaşa.
(19) Toprakkale, Payas, Iskenderon, on the Toprakkale–Iskenderon branch of the Baghdad railway (Rly. 20).
(20) Iskenderon.

Approximate provincial responsibility for road construction and maintenance is as follows; roads are listed by vilâyets in the order in which they occur in the text:

Içel: Mersin–Yenice (8); Tarsus–Külek (9); Silifke–Medreselik (10); Silifke–Ayaş (11); Tabaklar–Tarsus (14).
Konya: Medreselik–Karaman (10); Ayaş–Karaman (11).
Niğde: Koçak–Ulukişla (9).
Seyhan: Yenice–Adana (8); Külek–Koçak (9); Tuzla–Adana (12); Karataş–Adana (13); Karataş–Tabaklar (14); Karataş–Ceyhan (15); Adana–Karaisali (16); Adana–Kozan (17); Adana–Fevzipaşa (18); Toprakkale–Payas (19).
Hatay: Payas–Iskenderon (19); Iskenderon–Antakya (20).

Eastern Sector

Fevzipaşa, the railway junction at the eastern end of the Hasanbeyli pass which opens on the Kara valley between the Gâvur Dağ and Kurt Dağ, is an important road and rail centre, with roads leading

north, south, east, and west—northwards to Maraş, which is becoming an important route-centre, southwards to Antakya (Antioch) and Aleppo, key points for the Syrian routes, and eastwards to Gaziantep, a base for the Euphrates crossings. The road from the west has already been mentioned (p. 444).

(21) *Fevzipaşa–Maraş* (45 miles)

This road leads northwards up the trough between the Gâvur Dağ and the Kurt Dağ; it is believed to be metalled and fit for wheeled traffic in all weathers for most of the way. As far as Eloğlu the road follows the Fevzipaşa–Malatya railway, passing the marshes of Gâvur Gölü. It then leaves the railway and follows the Ak Su tributary of the Ceyhan to the Maraş plain, where it crosses the Ergenez tributary of the Ak Su by a masonry or concrete bridge. The Ak Su is crossed at Dökçemistil, where a seven-span reinforced concrete bridge (No. 83) was completed in 1939. The other bridges are thought to be still of timber. The road has been reconstructed between Fevzipaşa and Kömürler station and between Keçiler station and Maraş; repairs were in progress on this last section in 1940.

From Maraş several old tracks into the Anti-Taurus appear to be undergoing reconstruction, possibly as motor-roads.

(*a*) *Maraş-Göksun* (60 miles). A difficult winding track, rising to over 3,500 feet in several places, crosses the fifth range of Anti-Taurus to reach Göksun on the Göksun tributary of the Ceyhan. In 1940 it was reported that most of this had been levelled and that metalling had been started. Two new wooden bridges, each 115 feet long, have been built over the Terbüzak and Kömür streams near Göksun, and three reinforced concrete bridges, Suçati (No. 84), Tekir (No. 85; fig. 101), and Alikaya (No. 86; fig. 102), over the Kayagözü, Tekir, and Göksun streams were completed in 1939.

(*b*) *Maraş–Andirin* (40 miles). A road leading west from Maraş across the Ceyhan to Andirin is reported under construction.

(*c*) *Göksun–Elbistan* (45 miles). A track leads up the depression between the fourth and fifth ranges of Anti-Taurus, to the upland plain of Elbistan where the Ceyhan collects its headwaters. This has recently been levelled and is being metalled (1941); it forms the only link between Maraş and Elbistan.

(22) *Fevzipaşa–Gaziantep* (64 miles)

This road leaves the Fevzipaşa–Maraş road a little to the south of Kömürler station, and crosses the Kurt Dağ near Sakçagözü, frequently

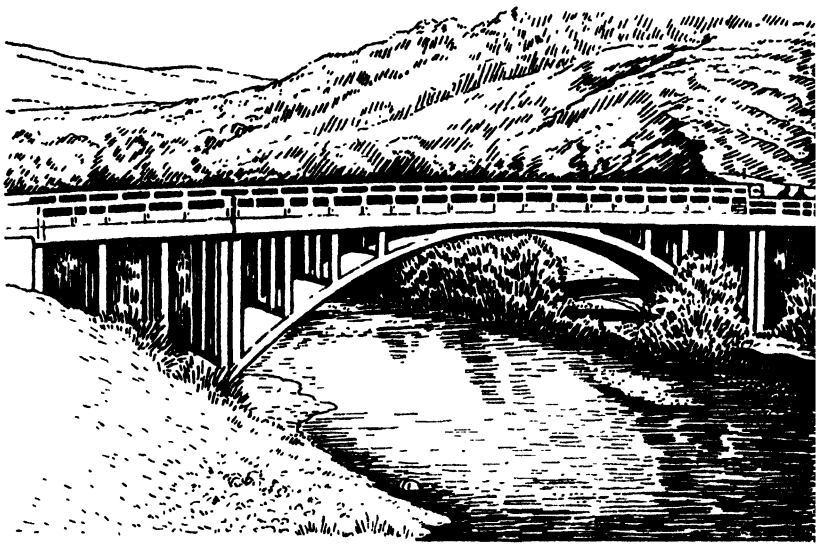


FIG. 101. *Tekir bridge* (*No. 85*)



FIG. 102. *Alikaya bridge* (*No. 86*)

rising above 3,500 feet. It turns sharply south-east at Köçke, crosses the headstream of the Nizip tributary of the Euphrates, rises again to over 3,500 feet, and then drops straight down to Gaziantep. It is said to be an all-weather metalled road, but no details of its condition or of its bridges are available.

(23) *Maraş–Gaziantep* (50 miles)

Maraş and Gaziantep are also directly connected by a road through Narli station and Köçke. Between Maraş and Narli it crosses a broad spur of the Gâvur Dağ and is well metalled, though the Ak Su is

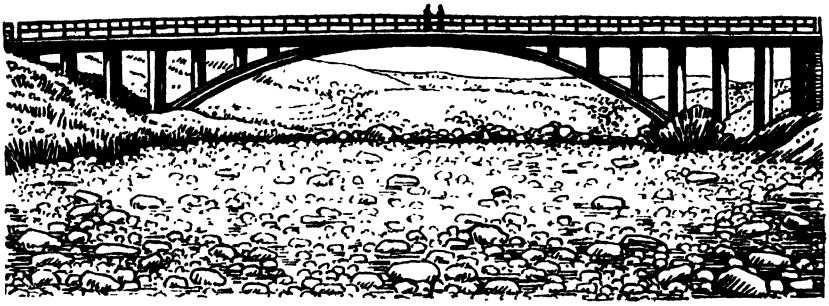


FIG. 103. *Afrin bridge* (*No. 82*)

crossed only by a timber bridge about 50 yards long which was renewed during the building of the Malatya railway in 1930. Beyond Narli the road deteriorates and is only classed as a dry-weather road until it reaches Köçke and joins the metalled road from Fevzipaşa. Light motor-buses run between Maraş and Gaziantep in summer.

(24) *Fevzipaşa-Kilis* (50 miles)

Formerly a poor country cart-road branching from the Fevzipaşa–Antakya road 5 miles from Fevzipaşa, this now seems to have been recently reconstructed as a light motor-road, though it may not yet be completed. Work was begun at both ends, but there are no reports that the middle section, where the road crosses the Kurt Dağ, has been finished. Two of the larger streams have reinforced concrete bridges, that over the boulder-strewn bed of the Afrin Su near the Syrian frontier at Şellah (No. 82; fig. 103) being 177 feet long with a central arch of 118 feet span and a roadway 20 feet wide; it was completed in 1937. The Karasu bridge (No. 80) near Fevzipaşa has two spans each of 33 feet and a roadway 10 feet wide. It is not known whether the Sabun tributary of the Afrin has yet been bridged.

(25) *Fevzipaşa–Antakya* (*Antioch*) (75 miles)

A metalled road in poor condition follows the depression between the Gâvur Dağ and Kurt Dağ southwards, through Islâhiye where it crosses the Fevzipaşa–Aleppo railway, keeping west of the Hupnik tributary of the Kara Su, and passing the western edge of Lake Amik; it crosses the Orontes by an old four-span stone bridge to Antakya on the left bank. It is joined by the important road from Iskenderon over the Beilan pass 25 miles north of Antakya, and continues beyond that town down the Orontes valley to Süvediye. A new bridge is reported under construction in 1941 near Ekbez, between Islâhiye and Hassa. It is to have masonry piers with wooden superstructure, and a single span of 50 feet.

(26) *Fevzipaşa–Meydaniekbez* (25 miles)

From Islâhiye a road branches from the Antakya road and follows the Aleppo railway southwards to the Syrian boundary at Meydaniekbez (1,350 ft.). It continues in Syria as a cart-track until joined by the main road from Antakya through Kirikhan and Katma to Aleppo. A new reinforced concrete bridge (No. 81), 95 feet long, over the Güvercinli stream between Islâhiye and Tahtaköprü was completed in 1941. It has three spans and a 10-foot roadway.

(27) *Kirikhan–Aleppo* (70 miles)

This is important as the shortest link between Aleppo and the sea. It leaves the Fevzipaşa–Antakya road north of the marshes of Lake Amik and reaches the frontier between the Hatay and Syria near Kişla. It then crosses the Kurt Dağ and turns north-east through Katma and south-east to Aleppo, receiving the roads from Meydaniekbez and Kilis. It is metalled and used to be fit for motor-traffic. Its condition since the transfer of the Hatay is unknown.

(28) *Antakya–Aleppo* (60 miles)

A more direct road from Antakya to Aleppo keeps south of Lake Amik and crosses the Orontes, running just north of the boundary between the Hatay and Syria. Near Yenişehir village it sends a short branch north to the Kirikhan–Aleppo road at Kişla, and a few miles east of this point crosses the boundary on its way to Aleppo.

The road is metalled, and fit for motor traffic in all weathers. The Orontes bridge, Jisr el Hadid, is an old stone structure of four spans, 77 yards long and 26 feet wide. During the Middle Ages it was one

of the most important strategic points in northern Syria, particularly during the Crusades. When reconstructed by Baldwin IV in 1161 it was defended at each end by towers, but these were destroyed in the earthquake of 1837. The western approach is still guarded by a bridge-head fort, and can be closed by a gate.

(29) *Antakya–Latakia* (76 miles)

This road runs south along the Ziyaret Dağ (4,100 ft.) to the Syrian port of Latakia. It crosses the boundary about 5 miles south of the village of Ordu.

(30) *Gaziantep–Ağaçkoyunlu* (30 miles)

Gaziantep is linked south-eastwards with Ağaçkoyunlu station on the Baghdad railway near the Syrian frontier, by a light motor-road which runs west of the Sacir tributary of the Euphrates through fairly open country. Thus both Maraş and Gaziantep, the chief towns of their respective vilâyets, are within easy reach of railway communication with Sivas, Malatya, Diyarbekir, and Nusaybin.

(31) *Gaziantep–Kilis–Katma* (60 miles)

A metalled road (45 miles) links Gaziantep southwards with Kilis, passing through easy, well-cultivated country, and with a fair number of villages lying off the road to the west. The state of the road is not known, but most of the streams draining the eastern slopes of the Kurt Dağ are bridged by stone or concrete structures. Beyond Kilis it continues as an old chaussée across the frontier, and joins the Fevzipaşa–Aleppo road and railway east of Katma station. It is believed to be fit for motors.

Eastern Sector: Summary

Points where the roads connect directly with the railways are summarized below:

Road (21) Fevzipaşa, Kömürler, Keçiler, Eloğlu, on the Fevzipaşa–Malatya line (Rly. 22).
(22) Fevzipaşa.
(23) Narli (Rly. 22).
(24) Fevzipaşa.
(25) Fevzipaşa, Islâhiye, on the Baghdad railway (Rly. 9).
(26) Fevzipaşa, Islâhiye (Rly. 9).
(27) Katma (Rly. 9).
(30) Ağaçkoyunlu (Rly. 21).
(31) Katma.

Approximate provincial responsibility for road construction and maintenance is as follows; roads are listed by vilâyets in the order in which they occur in the text:

Seyhan: Fevzipaşa–Hassa (25).
Maraş: Fevzipaşa–Maraş (21); Maraş–Göksun (21*a*); Maraş–Andirin (21*b*); Göksun–Elbistan (21*c*); Maraş–Narli (23).
Gaziantep: Fevzipaşa–Gaziantep (22); Narli–Gaziantep (23); Fevzipaşa–Kilis (24); Fevzipaşa–Meydaniekbez (26); Gaziantep–Ağaçkoyunlu (30); Gaziantep–Ibil (31).
Hatay: Hassa–Süvediye (25); Kirikhan–Kişla (27); Antakya–Yenişehir (28); Antakya–Ordu (29).

V. THE CENTRAL PLATEAU

The roads radiating outwards from the Central Plateau to the coastlands have been described. It has been shown that Sivas, Ankara, Eskişehir, Kütahya, Afyonkarahisar, and Konya are focal centres of communications to their respective coastal sectors, while Sivas and Malatya may be regarded as rearward bases for the communications of eastern and south-east Turkey (p. 479). These road centres all lie on the ancient historical routes which passed along the edges of the Central Plateau, for aridity has always restricted both settlement and intercourse to the margins. These historical plateau routes may be summarized as follows (I, p. 366):

(*a*) Eskişehir–Ankara–Yozgat–Sivas.
(*b*) Eskişehir–Kütahya–Afyonkarahisar–Konya–Ereğli.
(*c*) Ereğli–Kayseri–Sivas.
(*d*) Kayseri–Yozgat.
(*e*) Kayseri–Kirşehir–Ankara.

To-day railways have replaced all these old roads, except those from Ankara through Yozgat to Sivas, from Ankara through Kirşehir to Kayseri, and from Yozgat to Kayseri. The railway from Ankara to Kayseri makes use of the valley of the Delice Irmak, missing both Yozgat and Kirşehir, and there is no direct railway link between Ankara and Sivas through Yozgat.

The policy of the Turkish Government is to rely mainly on the railway net and to concentrate work on roads where these are not duplicated by railways. Thus, the best motor-roads from Izmit to Ankara lead through Bolu and Gerede, or by Geyve and Beypazari, and do not follow the railway from Eskişehir to Ankara; that from Izmit to Kütahya by-passes Eskişehir. Much of the road between

Afyonkarahisar, Konya, and Karaman was allowed to fall into complete disrepair, and some realinement has recently been carried out. All these roads are gradually being reconstructed as time and money permit, particular attention being paid to the reconstruction of bridges and the roads in the immediate neighbourhood of the chief provincial towns.

Across the plateau itself, from north to south, there are a number of tracks passable for cars and light lorries in dry summer weather. Little work has yet been done on these, and it is still customary for vehicles to prefer the open country at the side of the road to the road itself, which is often badly rutted.

In summer it is possible to cross the plateau in almost any direction, and starting from any point, for there are few watercourses or dry channels to create obstacles, and the higher ridges can always be avoided. Even the large expanse of Tuz Gölü can be crossed by wheeled traffic at the end of summer, e.g. between Yavşan and Ince Burun, when the salt-beds dry out. It is forded at its narrowest, between Koçhisar and Yenihan, when flooded in winter.

A few notes on these various plateau roads are given below.

(1) *Eskişehir–Beypazari–Ankara* (150 miles)

There are several alternative routes between Eskişehir and Beypazari, few of them more than rough tracks. The most direct route follows the railway down the Porsuk valley to Sariköy, then turns north through Mihaliççik, and joins the Üsküdar–Beypazari–Ankara road at Çayirhan, 20 miles west of Beypazari. There are no details of the crossing of the Porsuk at Sariköy, but the Koyunağli bridge (No. 88) over the Sakarya south of Çayirhan was completed in 1932. The road is 16 feet wide, mostly of water-bound macadam, but very rough in places. The section from Çayirhan to Ankara is mentioned with the roads of the Black Sea Coastlands (p. 384).

A number of modern bridges have been constructed around Ankara on the short roads which serve the outlying districts. These are as follows:

Orman Çiftliği bridge (No. 92), over the Ankara Çay at the Gazi Orman Çiftliği, 5 miles west of Ankara. It is 27 yards long, and was completed in 1926.

Etimesut bridge (No. 91), over the Ankara Çay, 20 miles west of Ankara, where a branch from the Üsküdar–Ankara road crosses to Etimesut, on the Eskişehir–Ankara railway. It is 44 yards long, and was completed in 1926.

Etlik bridge (No. 93), over the Çubuk Çay, 2 miles north-west of Ankara, on the Ankara–Etlik road. It has three spans and a total length of 39 yards, and was completed in 1927.

Ziraat bridge (No. 94), over the Çubuk Çay, 1½ miles north-west of Ankara, on the Ankara–Keçiören road. It is similar to the Etlik bridge and was completed in the same year.

Çubuk bridge (No. 95), over the Çubuk Çay, near the outskirts of Çubuk town, 25 miles north of Ankara, on the Ankara–Çubuk road. It is of reinforced concrete girder design, with four spans and a total length of 38 yards, and was completed in 1936.

(2) *Eskişehir–Sivrihisar–Polatli–Ankara* (175 miles)

According to some reports this road is passable for cars only in summer, but it may be fit for wheeled traffic in all weathers as far as Polatli. It crosses the Seyit tributary of the Sakarya at Hamidiye and again at Çifteler, then passes through Kaymas to Sivrihisar, and crosses the Sakarya to Polatli, on the Eskişehir–Ankara railway. It then turns south-east to Haymana, and north-east to join the Ankara–Kirşehir road at Gölbaşi, 10 miles south of Ankara. No details of any bridges are available, and it is doubtful whether the rivers can be crossed after heavy rain.

(3) *Eskişehir–Bilecik* (50 miles)

This road, macadamized, and in fairly good condition, links Eskişehir with the Marmara zone of Western Anatolia (p. 419). Its first section, as far as Inönü, forms part of the Eskişehir–Kütahya road (4). From Inönü it follows the railway through Bozüyük and down the Kara Su valley, crossing the river where it emerges from a defile near Karaköy by a stone bridge of two spans. The section from Karaköy to Bilecik has already been mentioned (p. 419).

(*a*) An alternative route (46 miles) between Eskişehir and Bilecik short-circuits the railway, but has a winding course through the uplands which separate the Porsuk and Sakarya valleys. It crosses the western end of the Boz Dağ at 3,500 feet, and after passing through Söğüt descends to below 2,000 feet. The road is macadamized or stone-built, and in fairly good condition. The Yeniköy bridge (No. 57) over a tributary of the Kara Su near Bilecik was completed in 1939. It has three reinforced concrete spans (43+53+43 ft.).

(*b*) A road from Bilecik goes north to Vezirhan, where it crosses the Kara Su, then east across the Sakarya to Gölpazari; it may eventually be continued to join the Üsküdar–Beypazari–Ankara road between

Geyve and Göynük. The Vezirhan bridge (No. 56) over the Sakarya, 98 yards long, was completed in 1932.

(4) *Eskişehir–Kütahya–Afyonkarahisar* (130 miles)

Between Eskişehir and Kütahya the direct route is taken by the railway, but a road following the Eskişehir–Haydarpaşa railway up the Sarisu valley turns south near Inönü and crosses the hills, rising in places to over 3,300 feet, then follows the Porsuk valley to Kütahya. It is an all-weather road, 16 feet wide, of water-bound macadam, in good condition as far as Inönü, but very rough from Inönü to Kütahya. There are several new stone bridges over the Porsuk river.

From Kütahya to Afyonkarahisar the road roughly follows the railway, though in places it is as much as 10 miles to the west. In this section it is in very bad condition, and impassable in winter and in wet weather. The Porsuk is crossed 7 miles from Kütahya by an iron bridge (No. 87), 90 yards long, which was completed in 1930.

(*a*) Work is proceeding on several short roads radiating from Afyonkarahisar. Of these, the one from Çay, on the Afyonkarahisar–Konya road, provides a direct route through Bolvadin, Emirdağ, and Seyitgazi to Eskişehir, avoiding the long detour through Kütahya. The 1940 vilâyet report stated that short stretches and one bridge had been reconstructed.

(*b*) Another road from Afyonkarahisar links the plateau with the Southern Coastlands and Western Anatolia at Dinar (pp. 434, 438). It is metalled and in fair condition, and believed to be passable for cars in all weathers. Reconstruction was still in progress in 1940.

(*c*) Other roads on which work is proceeding are those to Gazligöl, following the Afyonkarahisar–Kütahya railway; to Sincanli (Sinanpaşa); and to Şuhut.

(5) *Afyonkarahisar–Konya–Karaman–Ulukişla* (310 miles)

This road is nowhere more than a dry-weather track, and little work appears to have been done on it, since its functions are at present fulfilled by the railway. It passes through Çay, Akşehir, Ilgin, Saideli (Kadinhan), Konya, and Karaman, never more than 20 miles from the railway. From Karaman to Ulukişla it closely follows the railway through Ayranci and Ereğli, along the foot of the Taurus mountains.

(6) *Ulukişla–Niğde–Kayseri* (126 miles)

This is an important road, for through Kayseri it links Ankara and Eastern Turkey with the Southern Coastlands. It closely follows the

railway, except between Arapli and Develi Karahisar, where it goes over the Araplibel pass, instead of through the Biçem gorge, and it is reported to be an all-weather motor-road, though rough in places. From Ulukişla it goes direct to Niğde, with a loop across the railway to Bor; near Incesu it joins the Ankara–Kayseri road 10 miles west of Kayseri. The country it traverses is bare and sparsely populated, but the route is easy, making use of natural gaps between the groups of volcanic hills, chief among which are the Melendiz Dağ and Erciyas. A few streams are crossed, chiefly by stone bridges.

(7) *Ankara–Bâlâ–Kirşehir–Kayseri* (210 miles)

This road is still in course of construction, and some stretches are impassable in wet weather. In 1938 Ankara vilâyet reported that 53 miles out of the 76 up to the vilâyet boundary were in first-class order and work on the remainder was proceeding. Kirşehir vilâyet reported in 1940 that 8 miles of the road within its boundaries had been completed and seven new bridges built. Thus, from Ankara to the Kizil Irmak the road is stone-built and in good condition; from the Kizil Irmak to Kirşehir it is in fair condition but still undergoing repair; from Kirşehir to Mucur it is stone-built and in excellent condition; from Mucur to Kayseri it is in bad condition apart from short stretches which have been repaired. No details of the crossing of the Kizil Irmak at Köprüköy, between Bâlâ and Kirşehir, are available.

There are several branches from this road, of which the most important are:

(*a*) *Sofular–Keskin–Küçükyozgat–Ankara* (80 miles). This road connects through Keskin with Kirikkale on the Ankara–Kayseri railway, and then follows the railway through Yahşihan and Küçükyozgat to Ankara. As far as Keskin it is only a summer track, but from Keskin to Ankara it is believed to be metalled and in fairly good condition, or undergoing reconstruction.

(*b*) *Kirşehir–Yozgat–Çorum* (120 miles). A road branches from the Ankara–Kayseri road near Çuğun, 12 miles north of Kirşehir, through Çiçekdağı to Yerköy, where it crosses the Ankara–Sivas railway and the Delice Irmak. It continues through Yozgat and Hüseyinabat to Çorum, where it meets the Samsun–Çerikli road of the Black Sea Coastlands (p. 390). It is believed to be a metalled motor-road in fair condition, and it provides the only through road connexion between Ankara and the port of Samsun.

(*c*) *Kirşehir–Koçhisar* (50 miles). This road is believed to be

under construction, for Kirşehir vilâyet listed it among the most important roads of the province in 1938, but its alinement is uncertain and there is no information about the crossing of the Kizil Irmak.

(*d*) *Kirşehir–Arapsun–Nevşehir–Ürgüp–Incesu* (75 miles). At present this is only a summer track which leaves the Ankara–Kayseri road at Mucur, 15 miles east of Kirşehir, but the construction of the Arapsun bridge (No. 98) over the Kizil Irmak in 1934 indicates that it may be reconstructed as a motor-road. A branch from Nevşehir through Derinkuyu to Niğde is shown on Turkish maps, and when completed it will provide a direct route between Kirşehir and Niğde. South of the Kizil Irmak the road passes through the weird volcanic country of the Üçhisar district, where some of the population still live in cave-dwellings hollowed out of the tuff. The Damsa Çay is crossed at Ürgüp, where a reinforced concrete bridge (No. 100) of four spans (50+66+49+131 ft.) was completed in 1939.

(*e*) *Kirşehir–Avanos–Ürgüp* (60 miles). Another track leaves the Kirşehir–Arapsun road at Kayi, 12 miles south-east of Mucur, and goes through Hacibektaş to Avanos, where the Kizil Irmak is crossed by the Avanos bridge (No. 99), which is 175 yards long and was completed in 1926. A short road links Avanos with Ürgüp.

(8) *Kayseri–Sivas* (120 miles)

Through Kayseri all the plateau roads are linked with Sivas, an important junction for the Black Sea Coastlands and for Eastern Turkey. The Kayseri–Sivas road is little better than a cart-track, though it is fully bridged and metalled in some parts, and can be used by 3-ton lorries in dry weather. It closely follows the railway, except between Hanli and Sivas, where the road takes a shorter route, and crosses it in several places. The Sarioğlan bridge (No. 101) over the Sarioğlan Dere, between Kayseri and Şarkişla, was completed in 1930. It has three spans and a total length of 33 yards.

A branch from Şarkişla to Akçakişla is believed to be under construction, for the Bozkurt bridge (No. 102), 155 yards long, over the Kizil Irmak, was completed in 1938.

(*a*) *Kayseri–Saimbeyli* (70 miles). A road from Kayseri goes south to Develi (Everek), and in 1938 the vilâyet reported that the continuation of this road to Saimbeyli had been surveyed and that construction had begun.

(9) *Yozgat–Sivas* (140 miles)

A road branches from the Kirşehir–Çorum road (7*b*) at Çalati,

10 miles north-east of Yozgat, and goes through Sorgun and Akdağmadeni to Yildizeli, on the Sinop–Sivas road 30 miles from Sivas (p. 400). It is shown as a motor-road on Turkish maps, except for the 50-mile section between Belcik and Yildizeli. The Sivas vilâyet report of 1940 stated that 10 miles of the road had been levelled, presumably near Yildizeli on this 50-mile section.

(10) *Malatya–Sivas* (140 miles)

This road links the Central Plateau with Eastern and South-east Turkey and with the Southern Coastlands. It follows the railway fairly closely across the rounded ranges which separate the Kizil Irmak from the Euphrates. Though some work has been done on the road, it is only fit for motor traffic in dry weather.

It crosses the Fevzipaşa railway at Eskimalatya and approaches the Sivas railway near Fethiye. It then passes through fairly open plateau-country, making use of the Davulgan valley, by Hekimhan (3,380 ft.), Alacahan, Kangal (4,730 ft.), and Ulaş. Between these last two places it rises to 6,340 feet at Deliktaş.

(*a*) A second route between Malatya and Sivas (150 miles) keeps well to the west of the railway, passing through Akçadağ, Darende, and Gürün; it joins the Hekimhan road 5 miles south-east of Ulaş. At present it is fit for motor traffic in all weathers only as far as Akçadağ, but the 1940 vilâyet report stated that 90 miles had been levelled and that work was in progress.

(11) *Summer Tracks*

Of the summer tracks which cross the Central Plateau the most important are:

(*a*) Ankara – Haymana – Sülüklü – Böğrüdelik – Konya, which branches from the Eskişehir–Ankara road at Haymana. The journey from Haymana to Konya takes 6–7 hours by car.
(*b*) Konya–Ereğli.
(*c*) Konya–Aksaray–Kayseri, used by buses in summer between Konya and Aksaray.
(*d*) Ereğli–Niğde.

Summary of Bridges over the Kizil Irmak

(1) Wooden (?) bridge on the Divrik–Zara road, 2½ miles south of Zara.
(2) Old masonry bridge near Sivas (fig. 59, p. 367).
(3) Railway bridge at km. 4 on the Sivas–Çetinkaya line (Rly. 6).

(4) Kesik bridge, stone or concrete, on the Kayseri–Sivas road, 5 miles west of Sivas.
(5) Railway bridge between Söğütlühan and Kalin stations, on the Kayseri–Sivas line (Rly. 5).
(6) Railway bridge north of Kalin junction on the Samsun–Sivas line (Rly. 12).
(7) Bozkurt bridge (No. 102), on the Şarkişla–Akçakişla road.
(8) Railway bridge, lattice-girder, at about km. 349 on the Ankara–Kayseri line (Rly. 4).
(9) Stone or concrete bridge on the Ankara–Kayseri road, between Mucur and Kayseri.
(10) Avanos bridge (No. 99), on the Mucur–Ürgüp road.
(11) Arapsun bridge (No. 98), on the Mucur–Nevşehir road.
(12) Wooden (?) bridge at Köprüköy, on the Ankara–Kirşehir road.
(13) Wooden (?) bridge at Yahşihan, on the Ankara–Keskin road.
(14) Steel lattice-girder bridge at km. 72, on the Ankara–Kayseri line near Irmak station (Rly. 4).
(15) Wooden (?) bridge on the Çorum–Iskilip road.
(16) Koyunbaba masonry bridge (fig. 77, p. 395) at Osmancik, on the Tosya–Gümüşhaciköy road.
(17) Bafra bridge (No. 27) at Bafra, on the Sinop–Trabzon road.

Central Plateau: Summary

Points where the roads connect directly with the railways are summarized below:

Road (1) Eskişehir, junction for the Haydarpaşa, Balikesir, and Afyonkarahisar lines; Ağapinar, Alpu (Alpiköy), Sariköy, Etimesut, Gazi Orman, Ankara, between Eskişehir and Ankara (Rly. 3).
(2) Eskişehir; Polatli, Ankara, on the Eskişehir–Ankara line (Rly. 3).
(3) Eskişehir; Inönü, Bozüyük, Karaköy, Yayla, Bilecik, between Eskişehir and Izmit (Rly. 2).
(3*a*) Eskişehir; Çukurhisar, between Eskişehir and Izmit.
(3*b*) Bilecik, Vezirhan, between Eskişehir and Izmit.
(4) Eskişehir; Inönü, on the Haydarpaşa–Eskişehir line (Rly. 2); Kütahya, on the Balikesir–Kütahya line (Rly. 16); Çekürler, on the Eskişehir–Afyonkarahisar line (Rly. 8); Gecikhamam, on the Izmir–Afyonkarahisar line (Rly. 14); Afyonkarahisar.
(4*a*) Çay, between Afyonkarahisar and Konya (Rly. 8); Eskişehir.
(4*b*) Afyonkarahisar, Sandikli, Dinar, on the Afyonkarahisar–Dinar–Izmir line (Rly. 17).
(4*c*) Gazligöl, between Eskişehir and Afyonkarahisar (Rly. 8).

(5) Afyonkarahisar, Büyük Çobanlar, Çay, Ishakli, Yasyan, Akşehir, Azariköy, Argithan, Ilgin, Kadinhan, Konya, between Afyonkarahisar and Konya; Kaşinhan, Çumra, Karaman, Sidrova (Sidirva), Ayranciderbent, Alaca, Ereğli, Bulgarlu (Bulgurluk), Çayhan, Kardeşgediği, Ulukişla, between Konya and Ulukişla (Rlys. 8, 9).

(6) Bereket, Bor, Niğde, Andaval, Hüyük, Arapli, Develi Karahisar, Başköy, Incesu, Boğazköprü, Kayseri, on the Ulukişla–Kayseri line (Rly. 10).

(7) Ankara, Himmetdede, Beydeğirmeni, Boğazköprü, Kayseri, on the Ankara–Kayseri line (Rly. 4).

(7*a*) Kirikkale, Yahşihan, Küçükyozgat, Lalabel, Lalahan, Kayaş, Mamak, Ankara, on the Kayseri–Ankara line (Rly. 4).

(7*b*) Yerköy, between Ankara and Kayseri.

(7*d*) Incesu, on the Ulukişla–Kayseri line (Rly. 10).

(8) Kayseri, Gömeç, Sarmisakli, Tuzhisar, Sarioğlan, Gemerek, Ihsanli, Şarkişla, Hanli, Sivas, on the Kayseri–Sivas line (Rly. 5).

(8*a*) Kayseri.

(9) Yildizeli, Menteşe, Söğütlühan, Sivas, on the Sivas–Samsun line (Rly. 12).

(10) Malatya, junction for the Sivas, Fevzipaşa, and Diyarbekir lines; Eskimalatya on the Malatya–Diyarbekir line (Rly. 22); Sarsap, Kesikköprü, Hekimhan, Hasançelebi, Akgedik, Bozarmut, Tecer, Sivas, on the Malatya–Sivas line (Rlys. 23, 6).

Road Construction and Maintenance

The approximate provincial responsibility for road construction and maintenance is shown below; roads are listed by vilâyets in the order in which they occur in the text:

Eskişehir: Eskişehir–Çayirhan (1); Eskişehir–Polatli (2); Eskişehir–Inönü (3); Eskişehir–Söğüt (3*a*); Eskişehir–Inönü (4); Emirdağ–Eskişehir (4*a*).

Bilecik: Inönü–Bilecik (3); Söğüt–Bilecik (3*a*); Bilecik–Gölpazari (3*b*).

Kütahya: Inönü–Eğret (4).

Afyonkarahisar: Eğret–Afyonkarahisar (4); Çay–Emirdağ (4*a*); Afyonkarahisar–Dinar (4*b*); Afyonkarahisar to Gazligöl, to Sincanli, and to Şuhut (4*c*); Afyonkarahisar–Ishakli (5).

Ankara: Çayirhan–Ankara (1); Polatli–Ankara (2); Ankara–Karahacili (7); Sofular–Ankara (7*a*); Kizil Irmak–Koçhisar (7*c*); Ankara–Sülüklü (11*a*).

Konya: Ishakli–Ulukişla (5); Sülüklü–Konya (11*a*); Konya–Ereğli (11*b*); Konya–Obruk (11*c*).

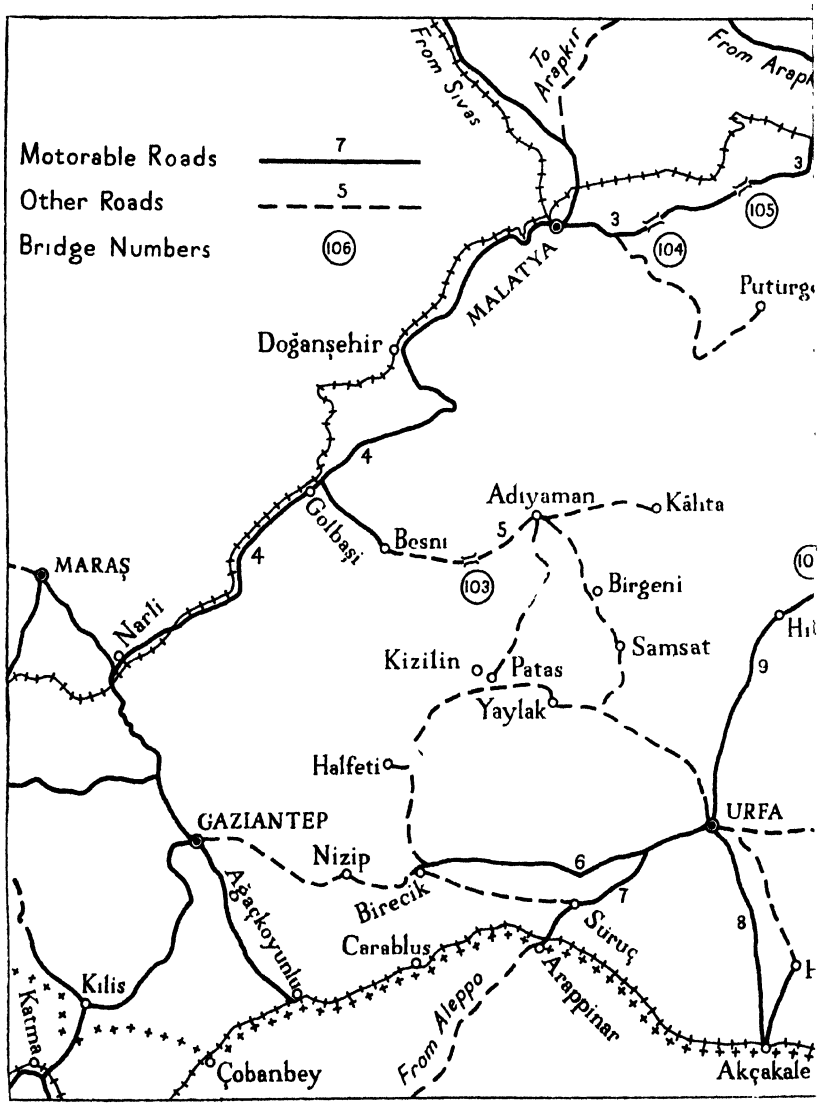


FIG. 105. *Road Map of South-east Turkey*

Kirşehir: Karahacili–Himmetdede (7); Kirşehir–Yerköy (7*b*); Kirşehir–Kizil Irmak (7*c*); Kirşehir–Kayi (7*d*); Kirşehir–Kayi (7*e*).
Yozgat: Yerköy–Hüseynabat (7*b*); Yozgat–Akdağmadeni (9).
Çorum: Hüseynabat–Çorum (7*b*).
Niğde: Ulukişla–Höyük (6); Kayi–Nevşehir, Nevşehir–Niğde (7*d*); Kayi–Avanos (7*e*); Obruk–Nevşehir (11*c*); Ereğli–Niğde (11*d*).
Kayseri: Höyük–Kayseri (6); Himmetdede–Kayseri (7); Nevşehir–Incesu (7*d*); Avanos–Ürgüp (7*e*); Kayseri–Sarioğlan (8); Kayseri–Saimbeyli (8*a*); Nevşehir–Kayseri (11*c*).
Sivas: Sarioğlan–Sivas, Şarkişla–Akçakişla (8); Akdağmadeni–Sivas (9); Hasançelebi–Sivas (10); Darende–Sivas (10*a*).
Malatya: Malatya–Hasançelebi (10); Malatya–Darende (10*a*).

VI. SOUTH-EAST TURKEY

LESS reconstruction has been carried out on the roads of south-eastern Turkey since 1923 than anywhere else in the country. The region is less settled and more difficult than elsewhere; its population is more mixed, and for years the Ottoman Government tried to eliminate the Armenian element; Kurds, Nestorians, Armenians, and Turks were ruined and scattered during the War of 1914–18; the resources of the country were depleted and banditry was rife. The boundary between Turkey and Iraq was not finally delimited until 1928, so that effective administration was difficult; more recently still, the Turks have had to undertake military operations for the resettlement of Kurdistan. Existing maps are still bad, and except for a few main routes which have been reconstructed and cleared of obstructions, and for the building of a few important bridges, little has yet been done to improve roads.

The historical routes between Europe and Mesopotamia have led through Cilicia and Syria, by Aleppo or Damascus, across the Euphrates south of Birecik, or have crossed the Syrian desert still farther south. In Roman times they were protected by an elaborate system of fortified posts each supporting its neighbour. They were flanked on the north along the mountain edge by the great fortresses of Edessa, Amida, Nisibis, and Dara, which guarded their own natural but difficult lines of communications back through the Taurus to Asia Minor. In medieval times they were kept open by the same means; the Kurdish hills and the Armenian highlands have always been on the flank of the easier southern routes and have been content with far more primitive tracks.

With rapid motor and air transport these Syrian routes are even more important than in the past; but only the northernmost are now the direct concern of Turkey. Those from Aleppo to Nisibis and from Aleppo through Edessa to Amida are now taken by the Baghdad railway to Nusaybin (Nisibis), and by the two roads through Urfa (Edessa) and Siverek to Diyarbekir (Amida), and through Viranşehir to Nusaybin.

Turkish efforts have been directed towards improving these and other existing roads, and towards opening up motor-road communications with the plateau and between places not yet reached by the railways. The basis of the plan was the building of the railway from Fevzipaşa through Malatya to Diyarbekir, completed in 1935, and of that from Sivas to Malatya, finished in 1937. Elâziz is linked by a short branch-line to Yolçati on the Malatya–Diyarbekir railway, and extensions of this branch and of the main line beyond Diyarbekir are under construction (Rlys. 26, 27). Malatya, Elâziz, and Diyarbekir are also joined by a motor-road, which is extended to Mardin and Nusaybin, where it joins the old Baghdad railway, and thence by Cizre and Zaho to Mosul in Iraq. This road and railway both pass through the upper valley of the Tigris which it has always been the function of Diyarbekir to guard.

The problem of the road-makers is to link the places not reached by either of the railways, and to open up the difficult country of the Kurdish Alps south of Lake Van.

The road communications will be considered in three sections: (*a*) the main road from Mardin through Diyarbekir to Elâziz and Malatya; (*b*) the communications of the area enclosed by the Baghdad railway and that from Fevzipaşa to Diyarbekir, east of the Maraş–Gaziantep–Ağaçkoyunlu road, which may be called the Syrian sector; and (*c*) roads east of the Mardin–Elâziz road and south of the watershed of the Kurdish Taurus, here called the Iraq sector.

Mardin by Diyarbekir to Malatya

Diyarbekir is separated from the Murat Su by the high precipitous Kurdish Taurus extending from Bitlis to the Euphrates valley near Çünküş. The eastern end is traversed by the Bitlis pass; in the middle the Tigris breaks through by the Ergani defile; on the west the Euphrates cuts a passage near Çünküş. There is no natural route from either Syria or Iraq to the Anatolian or Armenian plateaux by following the Euphrates or the Tigris valleys for any great distance.

Both rivers cut deep gorges in the mountains, at the bottom of which there is little room for roads; they are indeed obstacles to movement rather than natural passages for much of their courses. For a short distance, however, through the Ergani valley, the uppermost course of the Tigris, passes the only road fit for wheeled traffic through these mountains, and efforts are now being made to keep it in good repair, in order to supplement the capacity of the single line of the railway.

Between Elâziz and the upper Euphrates at Erzincan, and between Malatya and the upper Kizil Irmak at Sivas, the Euphrates valley again offers no natural land-routes; to the east of it the Dersim or Monzur range has to be crossed between Elâziz and Erzincan, and there is no easy passage. The best road to the north makes a detour from Elâziz to Malatya and crosses the high plateaux separating the Euphrates and Kizil Irmak.

The Kurdish Taurus stands up from the plains to a height of about 10,000 feet above the sea; in consequence, the rains of November and March are abundant and the rivers at those seasons are torrential. The winter snowfall on the heights closes the mountain passes for periods up to six months; and in the spring avalanches sweep away the paths. To keep roads in good condition for summer use requires work and attention every year, and no claim is made that they are passable in the rainy season or winter.

(1) *Mardin to Diyarbekir* (54 miles)

Mardin on the south is connected to Diyarbekir by a metalled road, 20 feet wide. From Mardin (alt. 3,780 ft.) the road descends to the Gov Çay and then mounts again to 3,500 feet to cross the Tigris watershed. The vilâyet report for 1938 stated that the road had been put into good order. One account states that it is a macadamized road fit for 8-ton lorries, but it is possible that about 20 miles in the middle require repair. Some of the small Kurdish villages on the old road before 1914 are no longer shown on Turkish maps, and they may have been deserted. The following are the chief villages and other features on the road:

Mile 0. Mardin (alt. 3,780 ft.).
5. Masonry bridge over Gov Çay.
23. Yukari Hanik.
31. Hanşaşper.
32. Stone bridge over Göksu.
35. Hanakpinar.

44. Masonry bridge (Kuruköprü), 5 arches, 20-ft. roadway with parapet, over Kuruçay, a considerable stream with rocky bed, difficult to ford. Length of bridge not known.
49. Masonry bridge over Havarçay descending from Karacali Dağ; length about 50 yards, 8 arches, 20-ft. roadway.
54. Diyarbekir (alt. 2,130 ft.).

(2) *Diyarbekir to Elâziz* (80 miles)

The road between Diyarbekir and Erganimadeni, the copper-mining centre in the uppermost Tigris valley, does not follow the Tigris, but reaches the valley north of Osmaniye, where the river has already turned eastwards to force a passage through the wooded Zülkiel Dağ of the Kurdish Taurus. Both road and railway take roughly the same alinement through Geyik and Osmaniye. The road has a metalled width of 20 feet and is claimed to be fit for light motor-traffic; its condition, however, must vary from year to year according to the repairs carried out and the weight of traffic; an undated French report (about 1938) stating that a third of the distance to Ergani (Osmaniye) was in bad condition is no criterion of its condition a year later.

Few villages are passed and the country is open though crossed by a few large stream-beds which may be almost dry in summer. The most important of these are spanned by old masonry bridges, the condition of which to-day is not known. They were in fairly good repair in 1918. The chief features of the road are as follows. Distances from Diyarbekir are given from a report thirty years old and appear to be underestimated.

Mile 0. Diyarbekir (alt. 2,126 ft., at railway station).
12. Masonry bridge, 145 yards long, 2 main and 5 subsidiary arches, over Devegeçedi (Şeytan) Su, a tributary of the Tigris. One report states there were only a few inches of water in November.
28. Col over low hill (alt. 2,680 ft.), roadway 20 ft. wide, gradient 1 in 20.
31. Masonry bridge over watercourse 50 ft. wide, dry in November.
35. Osmaniye (alt. about 3,250 ft.), close to Ergani railway station. There is a cart-road south-west to Çemik, whence a pony-track leads to Siverek. Road is now in the foothills of the Kurdish Taurus.
39. Col (alt. 3,500 ft.). Road 20 ft. wide cut in hill-side. Masonry culverts over small streams.
42. Kalemdan. Masonry bridge over Tigris, 90 yards long; 3 spans,

the largest of which is 40 ft.; roadway 15 ft. Tigris cuts a passage to the east through hills difficult to traverse. Road climbs on opposite bank through intricate hills. Wooden bridges and culverts over side streams.

46. Steep ascent to col (3,500 ft.) over spur; then descent to well-cultivated Tigris valley. River 20 ft. wide, but shallow in November and flowing over pebbly bed, lined with willow and poplar.

50. Erganimadeni (alt. 3,146 ft. at railway station).

Erganimadeni is an important copper-mining centre (pp. 119–21). Beyond it the valley closes in. According to one report the road narrows to 10 feet; a French report states that it is only a *piste*. Recent Turkish maps, however, show it as a metalled road fit for motors, and it is probable that during the construction of the railway it was improved as a 'service' road for light lorries, and has since been maintained. It is built up by masonry retaining walls in preference to being blasted or cut out of the hill-side and is liable to be destroyed by rock-falls. Side ravines are crossed by wooden bridges or culverts. The Tigris narrows to a gorge about 50 yards wide 3 miles north of Erganimadeni, but widens at Bahinetkan (m. 8) and again at mile 12, where it is about 200 yards wide. The gorge ends at Burnuskan. Details are not available, but the road is said to wind considerably.

The road leaves the railway near the south-east corner of the Gölcük lake (alt. 4,020 ft.) and passes by the east side of the lake over more open country to Elâziz. It is shown as a motor-road on Turkish maps. Elâziz is a modern town established about 4 miles from the old fortress of Kharput; it is the headquarters of the vilâyet of the same name. The distance by road between Erganimadeni and Elâziz is about 38 miles.

(3) *Elâziz to Malatya* (60 miles)

This road is important because it is the best line of communication across the Euphrates to the west. It does not take the same route as the railway, and the two are often as much as 10 miles apart. More work has probably been done on this road than on any other in south-east Turkey, and it is believed to be a good macadamized road, though the surface may be rough in places. It is fully bridged throughout, the Ismetpaşa bridge (No. 105), 172 yards long over the Euphrates, completed in 1932, being one of the finest in Turkey (fig. 106). The main reinforced concrete arch has a span of 357·6 feet. An old timber bridge over an important tributary, the Şişman Çayi,

has also been replaced by a large low reinforced concrete bridge, the Memikân (No. 104; fig. 107). This has six spans and a total length of about 70 yards; it was completed in 1937.

The 1940 vilâyet report mentions a direct road between Diyarbekir and Malatya which goes through Pütürge and is 86 miles long. It is believed to be under construction, and at present can only take regular motor traffic for eight months of the year. Only 10 miles is classed as good motor-road, but the rest has been levelled.

Communications in the Syrian Sector

There are no first-class motor-roads leading direct from Syria to the Anatolian plateau or to Armenia. Wheeled transport must go either by Adana, Pozanti, and Kayseri, by Gaziantep and Malatya, or by Diyarbekir and Elâziz. This fact emphasizes the great importance of the new railways from Fevzipaşa to Malatya, from Diyarbekir to Malatya, and from Malatya to Sivas, for as soon as any of them are reached by a road at any point, direct railway communication is made with any important city on the plateau through Sivas. It is on these railways, and on the old Baghdad railway between Fevzipaşa and Nusaybin—to a much less extent because of the Aleppo diversion—that road reconstruction is being planned.

The Euphrates Valley below Çünküş Ferry

The belt of country west of the Euphrates from Meskeneh in Syria to Samsat is mainly open rolling foothills and plain, well cultivated in places, especially in the neighbourhood of Aleppo, Kilis, and Gaziantep. The country gradually rises from the south in higher undulations and low downs, easy to traverse, up to the Taurus foothills. It is crossed by a number of indifferent tracks, passable but rough for carts in dry weather. The water supply is generally plentiful. The Euphrates valley itself is not difficult, certainly south of Birecik, but movement along it is impeded by wadis and ravines, and the valley has not formed a main land-route for traffic. *Keleks* (skin-rafts) are used on the river the whole way from a little below the Çünküş ferry to Carablus, where the river is crossed by the Baghdad railway.

At Birecik the commonest form of river transport used to be *shakhturs*, flat-bottomed boats about 18 feet long by 8 feet wide, with 1½-feet draught when loaded to their maximum capacity, about 5 tons. They are very roughly built, the interstices between the boards

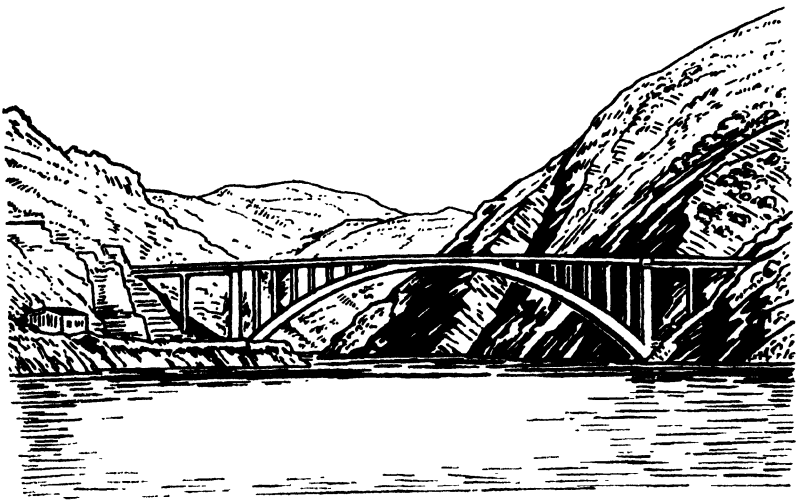


FIG. 106. *Ismetpaşa bridge* (*No. 105*)

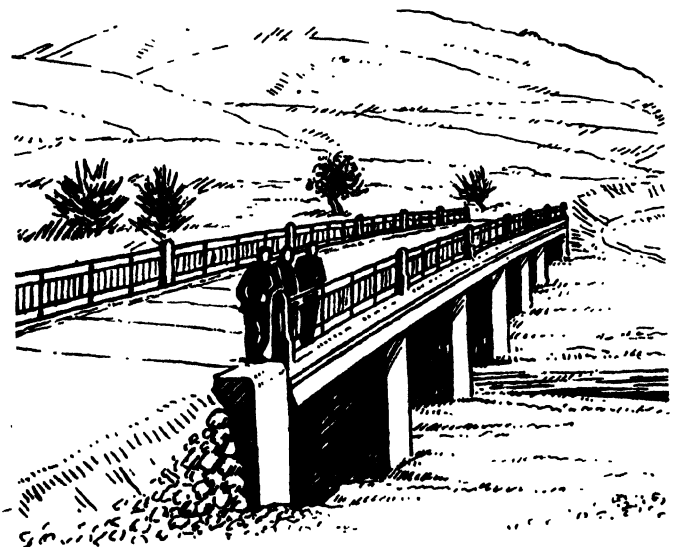


FIG. 107. *Memikân bridge* (*No. 104*)

being stuffed with rags daubed with bitumen. They nearly always travel in pairs, fastened together side by side, and are steered by clumsy sweeps, pulled in the bow. They are very difficult to manage and can only travel in a flat calm downstream. When they reach their destination they are either broken up and sold or laboriously towed back upstream. During the War of 1914–18 the Germans established a river-port at Carablus on the Baghdad railway and supplied the Turkish troops operating on the Euphrates to some extent by *shakhturs*. The boats were mostly made at Birecik.

On the eastern side of the Euphrates valley there is little traffic, though caravans sometimes make the journey. It must be remembered that this country is more sparsely inhabited now than it was thirty years ago, owing to the systematic deportation and massacres of the Armenian population during the war (p. 6) and to the pacification and settlement of the Kurds. The tracks here are not good, but from Birecik to opposite Halfeti, and thence at varying distances from the river past Samsat, there is a track that could be made passable for wheels.

The only bridge across the Euphrates between the new Ismetpaşa bridge (p. 467) on the Elâziz–Malatya road and the Syrian boundary is that which carries the Baghdad railway at Carablus (photo. 98). There has long been an important ferry at Birecik, and there are others at different points up-stream, such as at Halfeti and Rumkale (near the Merzumen junction with the Euphrates), at Kizilin (close to the Göksu junction), and at Samsat (which forms a link between Adiyaman and Urfa). Upstream of this point ferries become less frequent and appear to be operated seasonally (photo. 116).

Roads West of the Euphrates

(4) *Maraş–Malatya* (120 miles)

There have been proposals to link up Maraş with Malatya by a motor-road. Presumably this would be effected by Narli station and the general alinement of the railway would be followed. There is an old chaussée from Malatya to Doğanşehir, and a cart-road along the railway to the main road at Narli, between Gaziantep and Maraş. This road seems to have been improved and used for light lorries during the construction of the railway, and it may have been kept up. It is said to be a dry-weather road used by buses in summer.

(5) *Gölbaşi–Besni–Adiyaman–Kâhta–Euphrates*

A report in 1938 refers to this road which is apparently under con-

struction. Its exact alinement is not shown on published maps, but it is said to afford the best line of communication between Adiyaman or Kâhta and the Fevzipaşa–Malatya railway. The new bridge over the Gök Su (No. 103; fig. 108) was finished in 1935, having three reinforced-concrete arches, approximately 115 feet each, with a roadway 13 feet wide. Its foundations are strongly locked in solid rock.

The vilâyet report of 1940 states that the section between Gölbaşi and Besni (19 miles) is in need of repair, and that the rest of the road, from Besni to Kâhta, was only open for four months during 1939.

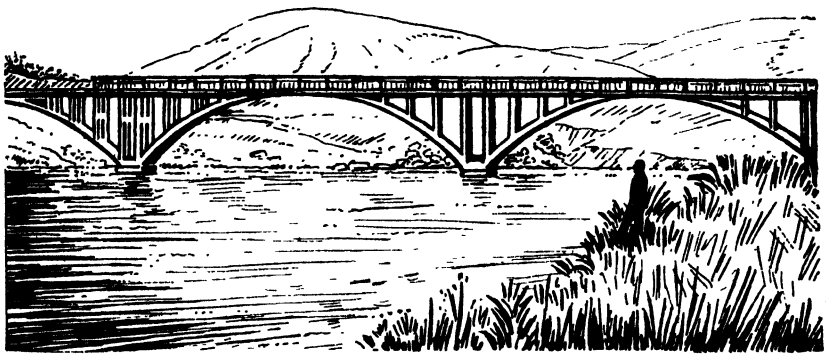


FIG. 108. *Göksu road-bridge* (*No. 103*)

Of the 55 miles between Besni and Kâhta, 10 miles are in need of repair and 10 miles are not yet levelled, there being only 9 miles of good motor-road.

It is not known whether Adiyaman or Kâhta are to be connected by motor-road to the Euphrates, but between Adiyaman and Samsat the country is open and fairly easy for wheels, being made up of rolling downs, traversed by streams from the north. There is an old cart-road from Adiyaman as far as Birgeni (or Birgami), whence a good bridle-path continues over rolling hills to Samsat, which is connected by a similar track to Urfa. Another cart-road leads almost due south from Adiyaman to Patas on the Euphrates near Kizilin, where a ferry connects it with the Halfeti–Yaylak–Urfa cart-road. Either of these two tracks from Adiyaman could be converted to motor-roads without much difficulty. The construction of such a road from Kâhta to the Euphrates would be less easy, though very useful; Hilvan and Siverek, on the Urfa–Diyarbekir road, are not far distant.

The most likely motor-road to be constructed, however, is from Gaziantep by Nizip and Birecik, for this would link up with the main

road now under reconstruction between Birecik, Urfa, and Diyarbekir.

Gaziantep–Ağaçkoyunlu. The motor-road connexion between Gaziantep and Ağaçkoyunlu on the Baghdad railway has been mentioned above, p. 451.

Roads East of the Euphrates

Roads from the west and south converge on Urfa, the ancient Edessa. There are three or four fit for wheels, though much of the country is open rolling heathland over which it would not be difficult to take tracked vehicles. Before 1918 the usual route from Aleppo was a cart-road, very rough in places, which crossed the Euphrates at Tel Ahmar, about 20 miles south of Carablus, the ancient Hittite capital of Carchemish, now the point where the Baghdad railway crosses the river, close to the Syrian boundary. This old road reaches the present boundary near Arappinar, crosses the railway, and passes through Sürüç to Urfa. From here there were two cart-roads, a northern one by the lower spurs of the hills by Hilvan and Siverek to Diyarbekir, and a southern one through more open plain (except where it crosses the Tektek Dağlari), through Viranşehir to Mardin. Urfa was also reached by two cart-roads from Birecik, and by a rougher one from Kizilin. It seems that all these roads had fallen into a shocking state of disrepair by 1920, and much work has been necessary since that date to make them even passable for wheels. Work has been concentrated on the northern route from Birecik to Urfa, on a new road from Akçakale on the Baghdad railway, to Urfa, and on the old Urfa–Hilvan–Siverek–Diyarbekir postal cart-road. No reconstruction appears to have taken place between Tel Ahmar and Urfa, or on the Birecik–Sürüç–Urfa or Urfa–Viranşehir–Mardin roads. Some additional notes are given below, but it should be emphasized that they may be unreliable.

(6) *Birecik–Urfa* (44 miles)

The road under repair is the northerly of the two old routes. It was originally metalled for a few miles east of Birecik, and the last 15 miles into Urfa were well-engineered metalled chaussée. Additional metalling appears to have been put down on the rest of the road, and though it may not yet be completely metalled, it is probably fit for light motor-traffic in dry weather, though the approaches to unbridged stream-beds will probably cause difficulty. In winter any part of the road not kept regularly in repair may become almost

impassable because of mud. Between Birecik and the Çermelek stream which crosses the road from the north about half-way, the country is open, bare, and undulating, the soil heavy, and there used to be a fair number of small and rather miserable villages inhabited by predatory Kurds. The only water in summer came from the wells at these villages, but it is uncertain to what extent they are now used. There are a few stony streams, dry in summer, to be crossed, the Abanor Çay (which seems now to bear the name of Zeki Dere) being the only one crossed by a culvert; the Çermelek stream is apparently unbridged. The last half of the road passes through bare, rocky, limestone hills where there are fewer villages, no supplies, and a scarcity of water.

(7) *Arappinar to Urfa* (40 miles)

This is part of the unmetalled cart-road used before 1914 between Aleppo and Urfa, which crossed the Euphrates at Tel Ahmar. Mürsitpinar (formerly Arappinar or Arab Bunar) station is close to the Syrian boundary, about 100 miles from Aleppo by the Baghdad railway. No work appears to have been done on the road, but it might be passable for light wheeled traffic in summer, and could be made fit for light motors fairly easily. There are, however, a number of stream-beds, and water is only plentiful in winter, when mud would make it difficult for wheels. The country passed through used to be inhabited by predatory Berazieh Kurds, but these have probably either settled down or moved elsewhere.

(8) *Akçakale to Urfa* (35 miles)

This seems to be a road made since the opening of the Baghdad railway. It leaves the railway at Akçakale or Tilebyaz (Tel Abyadh) station, about 136 miles (220 km.) from Aleppo.[1] It is said to be a metalled road about 20 feet wide and fit for motors, but no other details are available.

(9) *Urfa–Hilvan–Siverek–Diyarbekir* (110 miles)

This was originally part of the old post-road between Birecik and Diyarbekir, and was in use as such before the Baghdad and Diyarbekir railways were built. Between Urfa (1,850 ft.) and Siverek (2,800 ft.) it was an unmetalled cart-road, rough and stony as far as Hilvan (formerly Karacürün, or in Kurdish Jurn-i-Resh). From

[1] The road is wrongly shown on some maps as leaving the railway at Tüem or Tumen. This place is about 38 miles east of Akçakale.

here to Siverek the going was heavy and difficult in wet weather; from Siverek to Diyarbekir there was a rough stone chaussée foundation, metalled only for the last 30 miles. The whole was in bad condition with a rough boulder-strewn surface.

During the War of 1914–18 it served as part of the main line of communications for road transport between Carablus and Diyarbekir. The boulders were cleared and metalling was extended; but by 1920 it needed a great deal of repair. Since then traffic has been greatly reduced owing to the construction of railways to Mardin and Diyarbekir. A certain amount of reconstruction and repair work has since been carried out; exactly how much is not known. It appears that the Urfa–Hilvan section (about 30 miles) is still unmetalled. Beyond Hilvan the whole road is metalled and kept in fair repair.

Between Hilvan and Siverek (about 20 miles) there were two bridges, over the Çem Çay, 8 miles from Hilvan, and over the Zencibar Çay, 8 miles farther on. The first, known as the Hacikâmil Köprü, at one time a five-arched stone structure, has apparently been replaced by a new reinforced-concrete girder bridge (No. 106) with three spans of 50·5 feet, 65·6 feet, and 50·5 feet; it has a roadway 17·7 feet wide and was completed in 1937. The Çem Çay here flows in a narrow muddy valley, and though not large it never dries up. The other bridge, over the Zencibar Çay, is of masonry with three 15-foot arches, and has not been replaced.

Between Siverek and Diyarbekir (63 miles) the road is fully bridged where necessary, mostly by masonry arched structures. It passes over undulating ground, generally uncultivated. Siverek is at about 2,800 feet and the road gradually climbs over the desolate northern skirts of the Karacali Dağ, formed of the lava outpourings of this extinct volcano, which rises 6,300 feet above sea-level. Karabahçe, altitude 4,120 feet, a small village of about fifty huts, almost exactly half-way between Siverek and Diyarbekir, is near the highest point of the road.

(10) *Urfa–Viranşehir–Mardin* (112 miles)

No work appears to have been carried out on this old route since 1918, and no recent reports of it are available. Between Urfa and Viranşehir (55 miles) it passes through a limestone region. The route before 1914 was only passable for two-wheeled carts and guns and not for four-wheeled vehicles. The most difficult part of the route was in the Tektek Dağlari, where it was rough and stony; beyond them it passes over level country, crossing a number of

streams flowing from Karacali Dağ. Many of these have steep or cliff-sided descents on either side and would require clearing of rocks for four-wheeled transport. Water is so scarce that the route would be useless for extensive operations particularly in the Tektek Dağlari. The country is mainly inhabited by semi-nomadic Milli Kurds.

Between Viranşehir and Mardin (57 miles) the road is better supplied with water and for the first 15 miles passes through a comparatively fertile plain; but though shown on maps as a cart-road, it is winding and stony, bad for horses, and impassable for carts. The five streams to be crossed rise in the Karacali Dağ and flow in narrow rocky valleys. They cannot be forded in flood and all dry up in summer. From Derik to Mardin, the last 25 miles of the route, the track is rough and stony, and very heavy after rain on the plateau of the Mazi Dağ.

Communications in the Iraq Sector

As already stated (p. 463), communications in the extreme south-east of Turkey are very difficult. Any future development must depend primarily on the roads along the lower ground, from Diyarbekir through Silvan and Garzan to Siirt, and from the Mardin–Nusaybin–Cizre–Zaho road north-east of the Syrian boundary, or on penetrating the hills from the Van basin in the north. There is only one natural passage across the Kurdish Taurus east of longitude 41°, that through the Bitlis pass, a route formed by the Bitlis river cutting back its course across the axis of the range. The defile has been made passable by nature, lava from the Nemrut volcano having flowed down the valley and eased the gradient. It is the line of an ancient route, with remains of most periods of history; but though looked upon during the decline of Ottoman rule as a main route, the metalling was never completed, and in 1914 it was still unfinished and in bad condition. Probably the tribesmen held up work on it, and may have deliberately broken it down. Trouble between the government and the population (Kurds, Assyrians, and Armenians), corruption of the Ottoman officials, and the predatory instincts of the tribes all tended to prevent the completion of a good administrative road. When in 1917 the Russians evacuated the Van district, some work was done on the road, but though carts took the road from Diyarbekir by Bitlis to Van, the road was never properly metalled. At various times since 1923 projects for the construction of a railway through the Bitlis pass have been considered and abandoned because of the technical

difficulties involved, and finally it was decided to construct a military road to take its place.

Detailed information on road construction is extremely meagre, and probably very little has been done except on the roads already mentioned. The vilâyet reports for 1938 are significant: Siirt referred to the Diyarbekir–Garzan–Bitlis road as being put into a condition fit for motor-traffic; Bitlis reported that within the boundaries of the vilâyet 'all obstacles to wheeled traffic on the roads from Bitlis to Diyarbekir, Van, and Muş had been removed'; Hakâri made special mention of a new road under construction from Van to Çölemerik. The line of a cart-road or of a projected motor-road is shown on recent Turkish maps between these two places. It should be emphasized that much of the country has never been surveyed, and maps, compiled from travellers' accounts and other sources, disagree considerably in detail.[1]

It is not proposed here to give a detailed account of these roads or to describe the numerous tracks across the mountains. A few notes on the routes taken by the former are, however, collected below. Owing to the destruction of villages it is probable that few of them named in the old route reports and on Russian maps have any but historical significance. Away from these routes it may be assumed that all transport is by pack-animals.

(11) *Diyarbekir–Garzan–Bitlis* (150 miles)

There is no difficulty in getting cars through from Diyarbekir to the bridge over the Batman Su, at about mile 68, and 14 miles east of Silvan (Farkin). There is an old chaussée most of the way and several alternative unmetalled tracks. The Ambarçayi bridge (No. 107), with nine reinforced concrete spans each of 49 feet, was completed in 1939. The old Batman bridge (photo. 113, p. 368) with its approaches is 213 yards long; it has one span of 145 feet, the crown of the high pointed arch being 60 feet above the water; the right (west) bank approach has four small arches for flood water; the 20-foot roadway has low parapets and is narrowed at one point by a 10-foot gateway. From the Batman bridge to Garzan (Zok), mile 97, the road crosses fairly open plateau country, cut by numerous

[1] The best maps in the Van vilâyet are those (one inch to 4 miles) compiled by the Survey of India in 1924 from Russian surveys and published by the G.S.G.S. Sheet J38/H covers Van, J38/N Julamerk. The Russian surveys on which these were based do not go as far south as Julamerk (Çölemerik) and the Mesopotamian surveys (Survey of India) do not go so far north. The intermediate compilation of a strip of country in the Hakâri vilâyet cannot be made to fit.

shallow ravines, easy to cross in fine weather. The masonry Garzan bridge (No. 108; fig. 57, p. 360), built in 1924, the first major bridge of the Republic, is 118 feet long. An alternative route, from Malabadi on the Batman, through Hazo and Melefan, has been made possible by the construction in 1941 of the Pisyar bridge (No. 109; fig. 109) over the Garzan several miles above the Garzan bridge.

The exact alinement of the road between Garzan and Bitlis is not shown on published maps, but it almost certainly goes north-east and

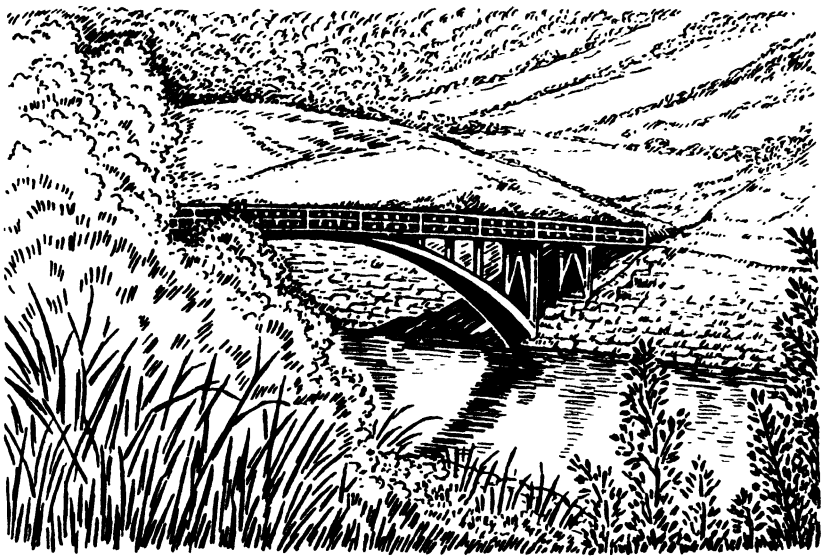


FIG. 109. *Pisyar bridge* (*No. 109*)

strikes the Bitlis Su (here called the Başor or Paşor Su), near the old shrine of Ziarat Waiz el Kuraini, about mile 110, and then follows this valley. The road is graded and cleared but probably still unmetalled, with no bridges or culverts. The valley narrows at several places with the road on the right bank throughout. Steep wooded spurs close in the left bank and rise to a ridge, about 6,000 feet above sea-level, which divides the Bitlis and Gezer rivers. Small Kurdish villages are passed on the way, but whether they have ever been reoccupied since 1920 is not known. The 'Bitlis Pass' begins about 20 miles beyond Ziarat (m. 130), where the valley makes a sharp bend to the north and the river issues from a defile. The road is cut into the rocks on the right bank above Dühan village (alt. 3,500 ft.). The

valley winds a great deal and varies between 300 and 400 yards in width at the bottom, the river generally forming a rapid torrent among stones and boulders. Towards the end of the pass the valley narrows to a gorge and the road ascends the lava rocks with a retaining wall on the river-side, and passes through a short tunnel. Bitlis is reached at about mile 150.

(12) *Diyarbekir–Siirt*

This road is identical with that described above as far as Garzan, but neither the exact alinement between Garzan and Siirt nor the



FIG. 110. *Gezer bridge* (*No. 110*)

distance is known. The Gezer bridge (No. 110; fig. 110) on this road, 5½ miles from Siirt, was reconstructed in 1934. It has four stone arches, each of 33 feet, and a total length of 60 yards; the road is 13 feet wide. In the reconstruction the central pier was sunk into solid rock. The Paşor bridge (No. 111), 11 miles from Siirt, is a fine new reinforced-concrete bridge with a single arch of 165 feet, a total length with side bays of 81 yards, and a roadway 12 feet wide (fig. 111). This was also completed in 1934.

There is no evidence of any work on roads or bridges having been done between Siirt and the Iraq frontier.

(13) *Mardin–Nusaybin–Cizre–Zaho–Mosul* (200 miles)

Within Turkey this is a fine-weather track with a loose stone surface, fit for light motors. The Tigris is crossed by ferry at Cizre, an important centre for the nomads of the district. The Habur is

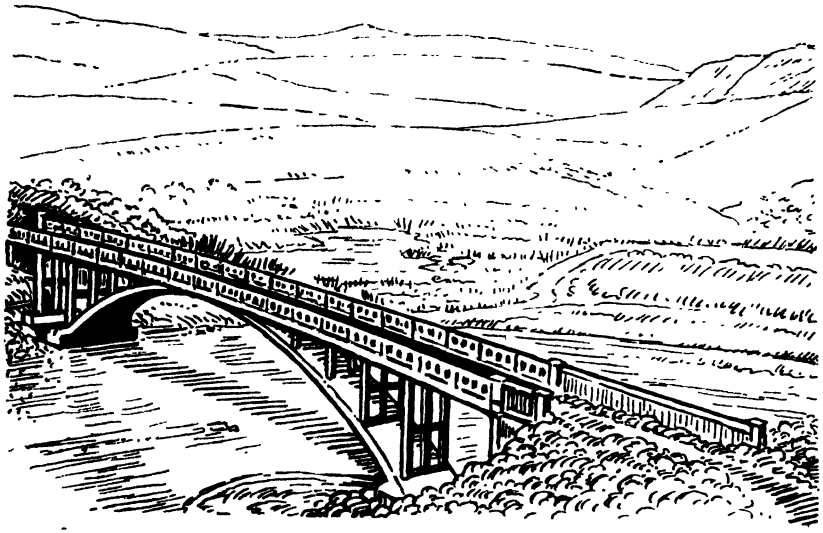


FIG. 111. *Paşor bridge* (*No. 111*)

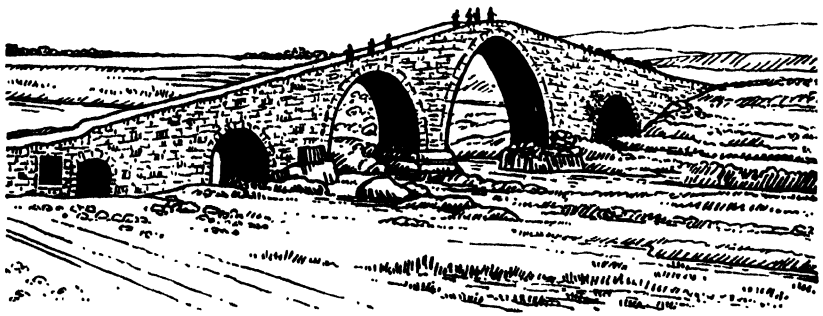


FIG. 112. *Old bridge over the Habur at Zaho*

crossed at Zaho by an old bridge on the Iraq side of the boundary (fig. 112).

(14) *Mardin–Savur–Midyat–Cizre* (90 miles)

A very rough track, open for 3-ton lorries from July to mid-

November, winds northwards over the Tigris–Habur watershed to Savur (2,950 ft.) in the upper valley of the Savur tributary of the Tigris. It recrosses the watershed at Midyat (3,120 ft.) and joins the Mosul road at Cizre.

(15) *Van–Çölemerik* (*Hakâri*) (75 miles)

There are no details of this new road. Comparing the trace of it shown on the Turkish 1:800,000 with the surveys made by the Russians during the last war, it would seem to go almost due south from Van to cross the Hoşap Su (Khoshab Su, Micinger Su) at Hağazi, then to ascend the Dimkosni (Dim Kosti) to the headwaters of the Botan Su (here called the Norduz Çay), and then to strike over high difficult ground to the upper basin of the Greater Zab (Büyük Zap Suyu) in which lies Çölemerik.

South-east Turkey: Summary

Points where the roads connect directly with the railways are summarized below:

Road (1) Diyarbekir (Rly. 22); Mardin, on a branch of the Baghdad railway (Rly. 21).
(2) Diyarbekir, Leylek, Erganimadeni, on the Diyarbekir–Malatya line (Rly. 22), and Elâziz on a branch of it.
(3) Elâziz, Yolçati, Malatya, on the Diyarbekir–Malatya line.
(4) Narli, Pazarcik, Haydarli, Gölbaşi, Doğanşehir (Viranşehir), Suçati, Akçadağ, Elemendik, Malatya, on the Fevzipaşa–Malatya line (Rly. 22).
(5) Gölbaşi.
(7) Mürsitpinar (Arappinar) on the Baghdad railway (Rly. 21).
(8) Akçakale (Tilebyaz, Tel Abyadh) (Rly. 21).
(9) Diyarbekir.
(10) Mardin, terminus of a branch from the Baghdad railway.
(11) Diyarbekir.
(12) Diyarbekir.
(13) Mardin; Nusaybin, Mosul, on the Baghdad railway.
(14) Mardin.

Approximate provincial responsibility for the construction and maintenance of roads is shown below; roads are listed by vilâyets in the order in which they occur in the text:

Maraş: Maraş–Narli (4).
Gaziantep: Narli–Gölbaşi (4).
Malatya: Kale–Malatya (3); Gölbaşi–Malatya (4); Gölbaşi–Kâhta (5).

Elâziz:	Erganimadeni–Elâziz (2); Elâziz–Kale (3).
Urfa:	Birecik–Urfa (6); Arappinar–Urfa (7); Akçakale–Urfa (8); Urfa–Karabahçe (9); Urfa–Viranşehir (10).
Diyarbekir:	Hanakpinar–Diyarbekir (1); Diyarbekir–Erganimadeni (2); Karabahçe–Diyarbekir (9); Diyarbekir–Silvan (11 and 12).
Mardin:	Mardin–Hanakpinar (1); Viranşehir–Mardin (10); Mardin–Cizre (13 and 14).
Siirt:	Silvan–Şetek (11); Silvan–Siirt (12); Cizre–Zaho (13).
Bitlis:	Şetek–Bitlis (11).
Van:	Van–Norduz (15).
Hakâri:	Norduz–Çölemerik (15).

VII. EASTERN TURKEY

THE topography of Eastern Turkey has been outlined in vol. I, pp. 179–94. It is the country drained mainly by the two chief feeders of the Euphrates, the Erzurum Kara Su and the Murat Su, some headwaters of the latter being cut off from contributing by the lava dam of Nemrut. The country is traversed by ranges and submerged by the lava sheets of numerous volcanoes.

Good roads are limited by the difficulties of linking up the various basins and valleys either through the defiles which connect them or over the mountain barriers which separate them. In the north the natural routes to Erzurum are (i) from Sivas by the Çalti Su, the upper Euphrates or Kara Su, and the Erzincan and Tercan ovas—the last two joined by the circuitous course of the Kara Su—and (ii) from Trabzon over the Zigana and Vavuk passes, both over 6,000 feet, to Bayburt and then over the Kop Dağ pass (8,100 ft.) to the Kara Su. In the south the Murat branch of the Euphrates also opens up a route from west to east from Malatya and Elâziz to Muş, Bitlis, and Van, while a second route comes north through the Kurdish Taurus by the Bitlis pass.

Sivas and Malatya are connected by railway (p. 253) and motor-road (p. 458); but east of this there are as yet no good communications between the railway to Erzurum, which takes the valley of the Kara Su, and the southern line of communication along the Murat valley, along which a railway is now being built (1942). Sivas, and to a less degree, Malatya, are therefore the western rearward bases of eastern Turkey, Trabzon and Diyarbekir the northern and southern bases, while Erzurum and the region round Muş and Bitlis are interior strategic centres. Politically Erzurum guards the roads from Soviet Russia (Georgia and Armenia); Bitlis, with its outpost at Van, watches

those from Persian Azerbaijan. They are only linked as yet by indifferent cart-roads, and each is the advanced base for its own forward communications which it is appropriate to describe as those of the Erzurum and Bitlis sectors. The pattern of roads in both sectors is much restricted by massive volcanic barriers: Alagöz (13,410 ft.), Ararat (16,946 ft.), and their satellites in the north; Nemrut (9,900 ft.), Suphan (14,540 ft.), Tendürük (10,870 ft.), and lesser ones in the south. Rivers and roads have to make detours round these obstacles or force passages between them.

The Erzurum Sector

Alagöz and Ararat also influence the frontier communications on the Russian side of the boundary. The Trans-Caucasus railway takes the Borchala tributary of the Kura (Koran) past Karaklis right to the pass at its head at 6,400 feet, only 12 miles north-east of Leninakan. The more direct military highway from Tiflis takes the Machavera tributary of the Kura; there is a succession of military posts along this road which crosses the Gori Mokriya range by a pass at nearly 7,500 feet about 18 miles north of Leninakan. A second road, south-east of the railway, also metalled and fit for motors, follows the Astafa tributary of the Kura, crosses a pass at about 7,000 feet to the Gökçe lake, and then follows the general course of the Zanga tributary of the Aras (Araks) to Erivan. The two roads and the railway are linked by a military road from Vorontsovka through Karaklis to Delijan along the heights north-east of Alagöz. West of Leninakan the railway has to circle the skirts of Alagöz (13,410 ft.) close to the Turkish boundary along the Arpa Çay, keeping to an altitude between 4,000 and 4,500 feet, and then the plain to the south of it, north of the marshes and distributaries of the Aras, in order to reach the plain of Erivan. After sending a branch line to the town of Erivan, the railway passes south with the Aras along the trench on the eastern skirts of Ararat to Julfa—the river here forming the boundary between the U.S.S.R. and Persia—and thence to its terminus at Tabriz. This railway and the communications based on it are the strategic factors with which Turkey has to deal, and they serve a part of the country where it is easy for Russia to concentrate in strength.

Aleksandropol, now Leninakan,[1] is in the middle of a bare plain and was founded by the Russians in 1820 to guard the road to Kars. The open plain of the Aras, on which stands Erivan, leads to Julfa, whence

[1] Still called by the Turks by their old name for it—Gümri or Gümru.

Tabriz is easy to reach. Leninakan and Erivan are the two natural gates to the Tiflis lowland and the Caucasus; Tabriz is the gate to Persia. From the first two towns natural routes converge westwards over the high plains of Kars and Sarikamiş on the north and by the Aras valley and Kağizman on the south towards Horasan and Erzurum. These are the historical routes into eastern Turkey by which migrations and invasions came long before the railway, or before the Grand Duke Nicholas took them in the War of 1914–18. Kars and Sarikamiş were then within the Russian frontier, with Horasan the Turkish outpost of Erzurum; the broad-gauge branch line from Leninakan to Sarikamiş and the narrow-gauge line thence to Erzurum were built by the Russians, and it was not till October 1921 that the boundary was finally withdrawn to the Arpa valley and roads and railways became the property of the Turks. It is on these old Russian communications that Turkey must base any new network of roads.

Taking the sector centred on Erzurum as extending along the Russian boundary from the Black Sea by Hopa to Doğubayazidi[1] (Bayazit) directly south-west of Ararat, the road pattern comprises the following main roads, not all of them yet reconstructed:

(1) The central road: Erzurum–Pasinler–Horasan–Sarikamiş–Kars–Leninakan.
(2) The lateral frontier road: Hopa–Borçka–Artvin–Ardahan–Kars–Kağizman–Tuzluca–Iğdir–Doğubayazidi (Bayazit).
(3) The northern wing road: Erzurum–Oltu–Göle–Ardahan–Zurzuna (Çildir), which crosses the boundary to Akhalkalaki (Ahilkelek).
(4) The southern wing road: Erzurum–Horasan–Karaköse[1]–Diyadin–Doğubayazidi.

The military importance of all these roads is plain from what has been written above, but there is another important aspect. The 'southern wing road' (No. 4 above) is part of the great trunk road from Trabzon through Erzurum to Persia. Here Doğubayazidi is the guardian on the Turkish side watching the gap south of Ararat, by which all trade for Persia goes on through Tabriz. But however well built the road, travel in these high regions is difficult in winter. Erzurum has a hard winter lasting for nearly seven months, with abundant snow till March. On the high plains of Göle, north-west of Kars, snow often

[1] Both Doğubayazidi and Karaköse have been known as Bayazid or Bayazit in the past. Karaköse is now the chief town of the Ağri vilâyet, and Doğubayazidi is therefore often known merely as Bayazit. Karaköse was also formerly known as Kara Kilise.

remains at 5,900 feet for eight months of the year, while passes over the mountains taking the lesser tracks may be blocked almost as long. The claim therefore to keep the trunk road to Persia open for all but thirty days can only be realized if road detachments are constantly at work.

Some further details of these roads are given below:

(1) *Erzurum–Horasan–Sarikamiş–Kars–Leninakan* (180 miles)

The route taken by the railway has already been described (p. 357). The road follows the same route to the Pasinler plain and upper basin of the Aras east of Erzurum and both leave that river at Çiftlik, 5 miles east of Horasan, and make for the plateau of Sarikamiş (6,500 ft.) in order to reach the basin of Kars (5,750 ft.); after diverging they come together again before crossing the boundary, but they are never more than 5 miles apart. The road was well metalled by the Russians, but in bad repair when the Turks took it over. A considerable amount of reconstruction has since been done, curves and gradients have been eased and other improvements made. It was reported in February 1940 to be passable for motor traffic as far as Sarikamiş, and there is reason to believe that the whole road is fit for motors and kept in good repair.

(2) *Hopa–Artvin–Ardahan–Kars–Iğdir–Doğubayazidi* (250 miles)

This road leaves the small Black Sea port of Hopa and meets the Çoruh river at Borçka, follows that river upstream to Artvin, and then forces a difficult passage over the mountains (*c.* 6,500 ft.) to Ardahan (5,900 ft.). It then traverses easier country south-east to Kars, follows the Sarikamiş road for about 8 miles, and branches south to Kağizman in the Aras valley, which it follows to Iğdir. From here, at 2,870 feet, to Doğubayazidi, 6,560 feet, the road has to climb above 7,000 feet over the lava neck that joins the lower slopes of Hama Dağ (10,640 ft.) to Ararat (16,946 ft.).

The road from Hopa to Ardahan is a well-built military one, 16 feet wide, and passable for lorries. In 1938 it crossed to the right bank of the Çoruh at Borçka, 22½ miles from Hopa, by a steel bowstring bridge (No. 124; fig. 114) with a single span of over 370 feet, the longest single span in Turkey. The roadway is of timber on metal bearers, and the bridge of a type extremely easy to destroy. Owing to landslips and to the consequent difficulty of maintaining the road between here and Artvin, it was decided in 1938 to build a new road on the left bank of the Çoruh. Work was begun, but no details of progress are available.

The road from Ardahan to Kars is 16 feet wide, well kept, and motorable. Accounts differ regarding the road from Kars to Kağizman and thence to Doğubayazidi. There appears to have been a metalled military road between Kars and Iğdir when in Russian possession, but

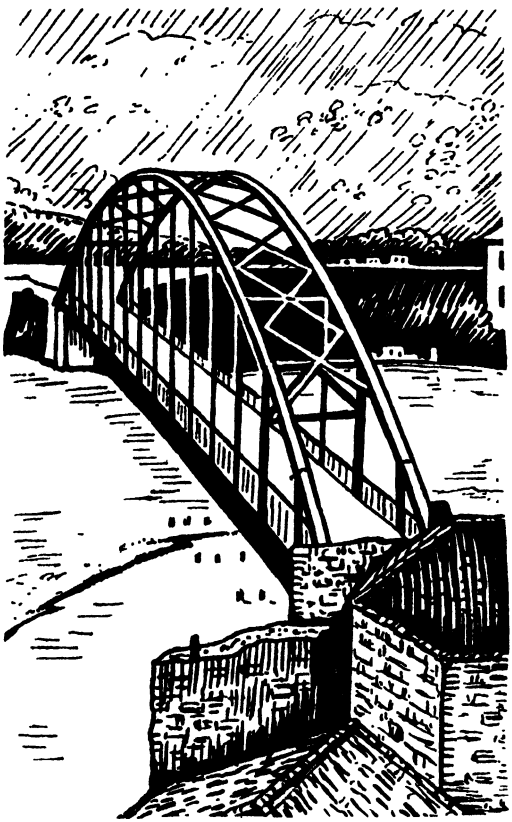


FIG. 114. *Borçka bridge* (*No. 124*)

the same alinement may not have been taken by the Turks. That part of it in the Kars vilâyet has been repaired, but to what extent is uncertain; the southern portion in the Ağri vilâyet is reported to be fit for wheels (1938). An alternative to the trunk road to Persia in February 1940 used the route Sarikamiş–Kağizman–Tuzluca–Iğdir–Doğubayazidi, so that it seems probable that the whole may now be fit for motors. There are also a number of tracks in this area fit for wheels in dry weather.

(3) *Erzurum–Oltu–Göle–Ardahan–Zurzuna* (*Çildir*) (160 miles)

Very little up-to-date information of this road is available. Parts of it only have been metalled in the past, and it was probably quite unfit for wheels until recently. The first part is a section of the old cart-road from Erzurum to Yusufeli on the Çoruh, and from this a cart-road branches to Oltu and Göle, where it meets an old Russian metalled road 16 feet wide through Ardahan, Zurzuna, and Akhalkalaki (Ahilkelek), on the main road between Batum and Tiflis. Some work has been done on the road between Erzurum and Dumlu, but



FIG. 115. *Horasan bridge* (*No. 123*)

of the section from here to Oltu little is known. From Oltu onwards the road is probably fit for light motors, and it appears from Turkish maps to be bridged throughout.

(4) *Erzurum–Horasan–Karaköse* (*Ağri*)*–Diyadin–Doğubayazidi* (205 miles)

This is part of the new trunk road from Trabzon to Persia. The first section as far as Horasan on the Aras is identical with the central road. At Çiftlik, 5 miles farther down the Aras, it turns south-east, crossing the river by a three-span bowstring bridge 360 feet long (Horasan, No. 123; fig. 115), and then taking the Velibaba and Kizkaşan passes to the catchment of the Murat head-streams. It passes through Eleşkirt (*c.* 6,000 ft.), which stands in an open plain, to Karaköse (Ağri), the chief town of this new vilâyet, which is at 5,400 feet on the Murat. It now turns east up the broad valley between the Ağri Dağ and the Ala Dağ to Diyadin (6,200 ft.), before entering the

gap between Ararat and Tendürük to reach the frontier town of Doğubayazidi (6,560 ft.).

The road has now been reconstructed and bridged throughout. It is 23 feet wide, fully metalled, carefully maintained throughout the summer months, and one of the main trade routes into Persia; it is said to be capable of taking fairly continuous motor-traffic and it is used by lorries. From the main Russian railway to Julfa, which follows the valley of the Aras, a narrow-gauge line was built during the War of 1914–18 to Doğubayazidi and by the route just outlined to Karaköse, but this has since been dismantled.

(5) *The Intermediate Links*

(*a*) There is a road from Sarikamiş, south to the Aras at Karakurt and then east along the Aras valley to Kağizman where the frontier road is met; from Karakurt to Kağizman it is very poor. Other old military roads, once passable for wheels, may have been made fit for light motors, but no details are available.

(*b*) Work has been reported on the road between Kağizman and Karaköse (Ağri), but it is not claimed to be fit for motors. The Akçay bridge over the Aras, where the road leaves route (2), was reported under construction in 1939.

(*c*) Göle and Kars are shown on some Turkish maps as linked directly by a motor-road, which was reported open for traffic in 1939.

Erzurum Sector: Summary

Points where the roads connect directly with the Erzurum–Leninakan railway (Rlys. 24, 25) are summarized below:

Road (1) Erzurum, Köprüköy, Horasan, Çiftlik, Karaurgan, Celâliye, Handere, Sarikamiş, between Erzurum and Sarikamiş; Yağbasan, Çatak, Benliahmet, Kars, Sahanalar, Leninakan, between Sarikamiş and Leninakan.
(2) Kars.
(3) Erzurum.
(4) Erzurum, Köprüköy, Horasan, Çiftlik, between Erzurum and Sarikamiş.
(5*a*) Sarikamiş.
(5*c*) Kars.

Road Construction and Maintenance

Approximate provincial responsibility for road construction and maintenance is shown below; roads are listed by vilâyets in the order in which they occur in the text:

Erzurum: Erzurum–Zeybek (1); Erzurum–Göle (3); Erzurum–Çiftlik (4).
Kars: Zeybek–Leninakan (1); Yalnizcam–Orkof (2); Göle–Zurzuna (3); Sarikamiş–Kağizman (5*a*); Kağizman–Cumaçay (5*b*); Göle–Kars (5*c*).
Çoruh: Hopa–Yalnizcam (2).
Ağri: Orkof–Doğubayazidi (2); Çiftlik–Doğubayazidi (4); Cumaçay–Karaköse (5*b*).

Bitlis–Van Sector

Turkish maps show a large number of cart-tracks in the vilâyets of Bitlis, Van, Bingöl, and Ağri, which are included in this sector, and carts drawn by horses or oxen are still the transport regularly used. Some of these tracks have been blocked by landslips for years, and until recently little could be done to clear them. Even now less work has been carried out in this sector than anywhere else in Turkey. Hardly any metalling has yet been put down, and even the best roads are only practicable for light cars in the dry season from about mid-May to the end of September. Heavily loaded convoys can never get through, and both in winter and in wet weather the roads become impassable even for carts. A number of such cart-roads go north from Muş, Bitlis, and Van to the Erzurum–Doğubayazidi trunk road, and doubtless some of these will eventually be developed as motor-roads, or their places taken by new railways. The most important are (6) from Muş by Hinis to Pasinler, east of Erzurum (100 miles), (7) from Muş and Ahlat through Malazkirt to Eleşkirt (130 and 100 miles), (8) from Van through Muradiye to Doğubayazidi (110 miles). When the Russians were in occupation of Van and Bitlis in 1916, a narrow-gauge railway was laid along the last route, but it was subsequently dismantled.

There are also several cart-roads leading from Van town, of which the most important are (9) Van–Kâzimpaşa (50 miles), and (10) Van–Bitlis (90 miles); but little construction or repair seems to have been carried out in the Van vilâyet except on the road going south to Çölemerik in the Hakâri mountains (p. 478), and on the Van–Bitlis route (No. 10 above) which follows the southern shore of Lake Van. The vilâyet reports of both Bitlis and Van for 1938 stressed the importance of these two roads.

From the west and south there are two main routes of entry: (i) from Elâziz, the terminus of a branch line of the Malatya–Diyarbekir railway, by Çapakçur, the chief town of Bingöl vilâyet, to Muş and Bitlis

and (ii) from Diyarbekir by the Bitlis pass to Bitlis (p. 474). The first is only an indifferent cart-road, in places probably unfit for wheels; but the survey for a railway to take its place was to be finished early in 1942, and construction of the first section, from Elâziz to Palu on the Murat, had already begun by the autumn of 1941 (p. 361). This railway is to be extended from Muş to Tatvan, and from Van to the Persian boundary. The Külüşkür (No. 112; fig. 116) and Alişam



FIG. 116. *Külüşkür bridge* (*No. 112*)

(No. 113) road-bridges were completed in 1939 over the Murat and Harinke Dere.

Bitlis–Van Sector: Summary

None of the roads described in this area connect directly with the railways, though cart-roads may link them with the Erzurum–Sarikamiş line in the north, and when the railway from Elâziz to Muş and Tatvan is finished there will be several road-railway junctions in the south.

Road Construction and Maintenance

Approximate provincial responsibility for construction and maintenance of roads is shown below; roads are listed by vilâyets in the order in which they occur in the text:

Muş: Muş–Hinis (6); Muş and Karakol to Adakent (7).

Erzurum: Hinis–Pasinler (6).
Ağri: Adakent–Eleşkirt (7).
Bitlis: Ahlat–Karakol (7); Verpan–Bitlis (10).
Van: Van–Doğubayazidi (8); Van–Kâzimpaşa (9); Van–Verpan (10).

Communications between Elâziz and the Kara Su

The country between the Kara Su branch of the Euphrates and the Murat Su has been briefly described in vol. I, pp. 184–6.



Fig. 117. *Singeç bridge* (*No. 117*)

The neighbourhood of Elâziz (3,350 ft.) is hilly, but not precipitous. It is enclosed on the north by the trough of the Murat river, which below Palu flows in rather more open country than between Genç and Palu. The valleys of the right-bank tributaries, the Kiği, Monzur, and Hozat, open up the country to the north across the axis of the Yökper Dağ, but the Monzur or Dersim mountains impose a lofty barrier, in places over 10,000 feet above sea-level as the Kara Su is approached. In the west another right-bank tributary, the Davulgan, opens a route to Sivas, while in the east the Murat valley affords a link with the Bitlis–Van sector at Muş (p. 486).

(11) *Elâziz–Kemah* (75 miles)

A road, fit for carts, and possibly for light motors in dry summer weather, though at present unmetalled, crosses the Murat river by the new concrete Singeç bridge (No. 117; fig. 117) and leads north to Hozat.

From here a track, suitable only for pack-animals, crosses the desolate Monzur Dağ to the Kara Su (Euphrates) at Kemah on the Sivas–Erzurum railway, where a suspension bridge (No. 122; fig. 118) spans the river, which is about 56 yards wide when in flood.[1]

(11 *a*) *Pertek–Mazkirt* (25 miles)

A branch from the Elâziz–Kemah road (11) is believed to be under construction from a point south of the Singeç bridge over the Murat through Pertek to Mazkirt. The Şehsu bridge (No. 115) over the



FIG. 118. *Kemah bridge* (*No. 122*)

Monzur tributary was completed in 1940. It is of iron-girder lattice design, with a length of 230 feet and a roadway 12 feet wide. The Pertek bridge (No. 116; fig. 119) over the Murat, where the river narrows between steep banks, has replaced the old wooden bridge 3 miles away. It was completed in 1939, and has a single reinforced concrete span of 348 feet.

Another road is being built from Pertek up the Monzur valley to Mamiki (Kalan) and then up a tributary to Nazimiye, whence it will eventually reach Plümür. Four new bridges were reported under construction or projected in 1939. These are the Kutuderesi, Türüşmek, Mamiki, and Seyithan. No details are available, except that the Kutuderesi bridge is to have a reinforced concrete superstructure, and that the first three lie between Pertek and Mamiki while the last is between Mamiki and Plümür.

[1] A summary of all the bridges over the Euphrates is given below (pp. 493–5).

(12) *Elâziz–Iliç–Erzurum* (260 miles)

A second road from Elâziz goes north-westwards and crosses the Euphrates 34 miles from Elâziz, below the confluence of the Murat



FIG. 119. *Pertek bridge* (*No. 116*)

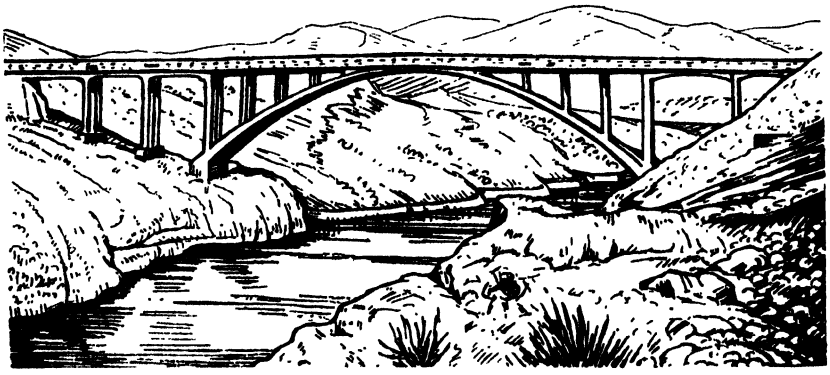


FIG. 120. *Kebanmadeni bridge* (*No. 118*)

Su, at the silver-mining settlement of Kebanmadeni (p. 123) by a new reinforced concrete bridge (No. 118; fig. 120). This, completed in 1937, has a large central span of 203 feet and a total length of 123 yards, with a roadway 12 feet wide. The road is said to be passable for

motors from Elâziz to Kebanmadeni, and may have been made fit for them in dry summer weather as far as Arapkir, where it degenerates into a bad cart-road. The Cipçayi bridge (No. 114), completed in 1939 of reinforced concrete, takes the road over the Cip stream at Habip. A new bridge (Kozluk, No. 119) was reported under construction in 1941 over the Arapkir river 3 miles north of Arapkir. It was to be 130 feet long, of iron girders, with a roadway 12 feet wide. No information is available of the condition of the road along the Euphrates valley in the neighbourhood of Kemaliye, but a new three-span bridge (Şirzi, No. 120) was reported under construction



FIG. 121. *Iliç bridge* (*No. 121*)

in 1941 over the Euphrates near Kemaliye. From here a cart-road to Iliç, on the Sivas–Erzurum railway, is shown on Turkish maps, and at Iliç the Kara Su is crossed by a new bridge (No. 121; fig. 121) completed in 1937, of three spans and a total length of 223 feet. There is no information about the road beyond Iliç, and it is unlikely that it follows the Euphrates valley, for the river between Kemah and Iliç flows through the Atma gorge. Probably there is only a rough track over the hills on the north side of the river, but the Kemah bridge (fig. 118), completed in 1937, the first modern suspension bridge in Turkey, takes the road over the Euphrates to Kemah on the left bank. From Kemah to Erzincan a cart-road follows the right bank of the Euphrates, crossing the river 5 miles upstream from Kemah by a stone or concrete bridge. The road between Erzincan and Erzurum has already been described (p. 409).

(12 *a*) *Malatya–Arapkir* (55 miles)

There is a direct connexion between Malatya and Erzurum, for a road leaves the Malatya–Sivas road immediately north of the Tohma river, about 12 miles north of Malatya, and joins the Elâziz–Erzurum road (12) about 10 miles south of Arapkir. This connexion, shown on

Turkish maps as a cart-road, keeps to the hills west of the Euphrates valley, crossing several deep tributary valleys in some of which the rivers are spanned by stone bridges. The Erzincan–Kemah–Malatya, Erzincan–Kemah–Elâziz, and Erzincan–Kemaliye–Elâziz roads of Turkish reports are therefore all identical between Erzincan and Arapkir.

The third, and still the most important road from Elâziz, however, avoids the Murat river, the Euphrates gorge, and the Monzur mountains by making a wide detour south-westwards to Malatya and then north to Sivas, taking generally the line of the railway. The Elâziz–Malatya section (60 miles) is described under South-east Turkey (p. 465), and the Malatya–Sivas section (140 miles) under the Central Plateau (p. 458).

Communications between Elâziz and the Kara Su: Summary

Points where the roads connect directly with the railways are summarized below:

Road (11) Elâziz, on a branch of the Malatya–Diyarbekir line (Rly. 22); Kemah, on the Sivas–Erzurum line (Rly. 7).

(12) Elâziz (Rly. 22); Iliç, Kemah, Erzincan, Altinbaşak, Geçit, Sansa, Erzurum, on the Sivas–Erzurum line (Rly. 7).

(12*a*) Malatya, junction for Sivas, Fevzipaşa and Diyarbekir lines, Eskimalatya on the Malatya–Diyarbekir line (Rly. 22).

Road Construction and Maintenance

Approximate provincial responsibility for construction and maintenance of roads is shown below; roads are listed by vilâyets in the order in which they occur in the text:

Elâziz: Elâziz–Pertek (11); Elâziz–Kebanmadeni (12).
Malatya: Kebanmadeni–Iliç (12); Malatya–Arapkir (12*a*).
Tunceli: Pertek–Kemah (11); Pertek–Mazkirt (11*a*).
Erzincan: Iliç–Geçit (12).
Erzurum: Geçit–Erzurum (12).

Navigation on the Upper Euphrates and the Upper Tigris

This subject has been dealt with in vol. I, pp. 177–9. There is little to add, except to stress that the valley of the Euphrates, in particular, does not lend itself as a useful line of communication across the strike of the ranges.

Important Bridges over the Euphrates

In view of the natural obstacle to movement created by the Euphrates, the crossing-places over the river assume great importance. The bridges, both road and railway, old and new, are summarized below. The spans indicate the approximate width of the river in the April flood season. (Distances on the railways are given in kilometres to assist identification.)

1. Kötürköprü road-bridge. Over the Kara Su tributary of the Firat, close to the junction of the Kara Su and the Tercan Su. River flows in a wide open plain. The bridge is old and has about ten small masonry arches; total length about 100 yards (photo. 79, p. 288).
2. Kötür railway bridge. Site close to No. 1, at about km. 309 on Çetinkaya–Erzurum railway. The bridge has two main box-girder spans with overhead bracing, with central masonry pier and masonry abutments; total length not known. It is reached by embankments and is shown in the same photograph.

(*The Kara Su and Tercan Su combine here to form the Firat or Euphrates.*)

3. Railway bridge, at km. 277·7 on Çetinkaya–Erzurum railway between Geçit and Sansa stations. Reinforced concrete bridge: three arches of about 66, 66, and 115 feet (photo. 77, p. 287).
4. Railway bridge, at km. 274·7 on the same railway and between the same stations. Reinforced concrete bridge: main span 223 feet, three subsidiary spans.
5. Timber road-bridge on Erzincan–Plümür cart-road about 25 miles east of Erzincan. No details.

(*These three bridges are upstream of Erzincan. There may be others of which details are not available. There may also be some old structures in the Erzincan plain.*)

6. Road-bridge on the Erzincan–Kemah road about 5 miles east of Kemah. Stone or concrete, no other details.
7. Kemah road-bridge (No. 122; fig. 118). On the Erzincan–Kemah–Elâziz road, on the outskirts of Kemah. A modern single-span steel cable suspension bridge, span 175·5 feet over

river 56 yards wide, where it flows between rocky banks. Timber roadway 7 ft. 10 in. wide. Completed 29 Nov. 1937.

(*Between Kemah and Iliç the Firat passes through the difficult Atma gorge. The railway crosses the river more than once, but details are not available.*)

8. Iliç road-bridge (No. 121; fig. 121) on the Erzincan–Kemaliye–Elâziz road at Iliç. A modern steel-girder bridge, central span lattice braced; three spans, 39·4 ft., 118·1 ft., 39·4 ft.; total length 74 yards. Timber roadway, width not known; completed 1937.
9. Firat railway bridge. At km. 96 on the Çetinkaya–Erzurum railway over the Firat below the junction of the Çalti Suyu. Modern double-span steel lattice-girder bridge, 2 × 196·9 ft.; total length not known (photos. 72, 73, p. 285).
10. Şirzi road-bridge (No. 120), on Erzincan–Kemaliye–Malatya road. Under construction in 1941. Three spans, iron superstructure; roadway 12 feet wide, total width 15 feet.
11. Kebanmadeni road-bridge (No. 118; fig. 120). At km. 55 (mile 34) from Elâziz on the Elâziz–Kebanmadeni–Arapkir road. The river here flows through a valley with rocky banks, and at low water is about 60 yards wide. At high flood it may be 50 feet higher and over 100 yards wide. Modern reinforced concrete arch of 203·4 feet span; three subsidiary spans on Arapkir side and two on Elâziz side, all of 32·8 feet, concrete girder construction; 2 × 32·8 ft. + 203·4 ft. + 3 × 32·8 ft.; total length 122·5 yards; roadway 12 feet wide; but 14·8 feet between parapets, which just allows cars to pass; completed 3 Sept. 1937.
12. Firat railway viaduct. At km. 284·0 from Fevzipaşa on the Fevzipaşa–Diyarbekir railway, 33·5 km. from Malatya. Ferro-concrete viaduct over the open valley of the Euphrates. Four main arches of 180·5 feet each and four subsidiary arches of 82 feet each; 4 × 180·5 ft. + 4 × 82 ft.; total length 384 yards. Normal low water covers three of the main spans, with river about 150 yards wide. Normal high water is 23 feet higher, the river then covering all four main arches and one subsidiary arch. Abnormal high flood covers all eight arches with the river 380 yards wide and 13 feet above high normal (photos. 107, 108, p. 351).
13. Ismetpaşa road-bridge (No. 105; fig. 106) on the Malatya–Elâziz road. Reinforced concrete bridge; main span 357·6 feet,

four subsidiary spans of 40 feet each, total length 172 yards. Completed 1932.

14. Carablus (Jerablus) railway bridge. At km. 119·5 from Aleppo on the Aleppo–Nusaybin–Baghdad railway, over the broad valley of the Euphrates. Steel lattice-girder bridge; ten overhead braced lattice-girder spans, 262 feet; total length 892 yards. Girders on concrete piers, faced with stone to bridge bed-plates, and built on foundations of interlocking concrete piles in iron casing, 46 ft. × 20 ft. in plan. Foundations in sand 42 feet deep, elsewhere on rock. Right bank of river protected by earthen bank on stone-wall foundation (photo. 98, p. 344).

LARGE ROAD BRIDGES, 1923–41

1. SÜNNET bridge, Istanbul vil., Karaköy–Silahtarağa road, over Kâğithane. Length 34 metres. 1932.
2. SILAHTARAĞA bridge, Istanbul vil., Karaköy–Silahtarağa road, over Alibey Dere. Length 34 metres. 1932.
3. ERGENE bridge (fig. 65), Tekirdağ vil., Muratli–Büyük Karıştiran road, over Ergene: reinforced concrete, main span bowstring design, three smaller spans straight, all on same side of main span. Length 69·7 metres (3 × 12·8 m. + 31·3 m.). 1937.
4. ERGENE bridge, Tekirdağ vil., Çerkeşköy–Vize road, over Ergene: reinforced concrete, bowstring design, foundation on blue silt. Length 22·5 metres; width 5·4 metres; roadway 4·8 metres. 1940.
5. POYRALI bridge, Kirklareli vil., Kirklareli–Vize road, over Sakizköy stream: reinforced concrete, 3 straight spans (3 × 10 m.). Width 6·0 metres; roadway 5·4 metres. 1939.
6. ÇAYIRDERE bridge, Kirklareli vil., Kirklareli–Vize road, over Çayir Dere: reinforced concrete, 3 straight spans (3 × 10 m.). Width 5·4 metres. 1940.
7. SOĞUCAKDERE bridge, Kirklareli vil., Kirklareli–Vize road, over Soğucak (Ahmet Bey) Dere, 13 km. from Vize: reinforced concrete, 2 straight spans (2 × 10 m.). Width 5·4 metres. 1940.
8. INECE bridge (fig. 63), Kirklareli vil., Kirklareli–Edirne road, over Inece, 15 km. from Kirklareli: reinforced concrete, 10 straight spans. Length 108·2 metres (10 × 10 m.). 1937.

9. SAZLIDERE bridge (fig. 61), Edirne vil., Istanbul–Edirne road, over Sazli Dere: reinforced concrete, 3 straight spans. Length 28·3 metres (3×9 m.). 1937.
10. KAVAK bridge (fig. 64), Çanakkale vil., Gelibolu–Keşan road, over Kavak river: reinforced concrete, 4 straight spans. Length 55·5 metres (12·1 m.+15·6 m.+15·6 m.+12·1 m.). 1938.
11. IRIVA bridge, Istanbul vil., Beykoz–Bozhane road, over Iriva Dere. Length 50 metres. 1925.
12. ÖMERLI bridge, Istanbul vil., Üsküdar–Şile road, over Iriva Dere. Length 72 metres. 1931.
13. GÖKSU bridge, Istanbul vil., Şile–Agva road, over Gök Su: 3 spans. Length 29·1 metres; width 6·0 metres, roadway 5·4 metres. 1939.

    The original design was for a single span of 28 metres, but bad foundations made this impossible. One pier rests on solid rock, and the other on reinforced concrete piles.
14. SAKARYA bridge (fig. 78), Kocaeli vil., Adapazari–Bolu road 4 km. from Adapazari, over Sakarya: reinforced concrete, bowstring design, 3 spans. Length 106 metres (3×35 m.); width 5·6 metres; roadway 4·8 metres. 1937.
15. MERKIÇMELEN bridge, Bolu vil., Bolu–Adapazari road, over Melen Dere: reinforced concrete, 5 spans. Length 130·5 metres (23·75 m.+26·50 m.+30·00 m.+26·50 m.+23·75 m.); width 6·0 metres; roadway 5·4 metres. 1941.
16. ANKARA bridge, Zonguldak vil., Zonguldak–Devrek road, over Üzülmez (Düzülmen) Dere. Length 26·0 metres. 1928.
17. ARSLAN bridge, Zonguldak vil., Ereğli–Devrek road, over Çayli Oğlu Dere. Length 48·0 metres (2×24 m.). 1929.
18. DEVREK bridge (fig. 69), Zonguldak vil., Zonguldak–Devrek road, over Devrek Irmak at Devrek: reinforced concrete girders, 3 straight spans. Length 60 metres (18·75 m.+22·50 m.+18·75 m.); roadway 5·4 metres. 1938.

    The river is fordable in the low-water season, but when in flood covers all three spans to a depth of 7 feet.
19. AFATLAR bridge (fig. 70), Bolu vil., Ankara–Gerede–Bolu road, over Ulu Su: reinforced concrete, 3 straight spans. Length 42·25 metres (13·0 m.+16·25 m.+13·0 m.). 1937.
20. KIRAZLIK bridge, Zonguldak vil., Bartin–Safranbolu road, over Kirazlik. Length 50·0 metres. 1928.
21. DEVREZ bridge (fig. 73), Çankiri vil., Çankiri–Kastamonu road,

over Devrez Çay: reinforced concrete girders, 5 straight spans. Length 82·15 metres (16·25 m.+16·75 m.+2×16·30 m.+16·10 m.); width 6·0 metres; roadway 5·4 metres. Foot-path for pedestrians. 1940.

22. ŞEKER bridge (fig. 72), Kastamonu vil., Kastamonu–Inebolu road, over Gök Irmak: reinforced concrete, 3 straight spans. Length 32·46 metres (3×10 m.). 1938.
23. KIVRIM bridge (fig. 75), Kastamonu vil., Kastamonu–Boyabat road, over Kivrim Çay: reinforced concrete, 3 straight spans. Length 42·25 metres (13·00 m.+16·25 m.+13·00 m.). 1938.
24. FEVZIPAŞA bridge, Sinop vil., Boyabat–Taşköprü road, over Gök Irmak: 2 spans. Length 52 metres (2×26 m.). 1932.
25. KARASU bridge, Sinop vil., Sinop–Ayancik road, over Kara Su: reinforced concrete, 3 spans (16·0 m.+18·0 m.+16·0 m.). Width 6·0 metres; roadway 5·4 metres. Foundations on hard clay below the sand and pebbles on the river-bed. 1939.
26. YEŞIL IRMAK bridge (fig. 82), Amasya vil., at Amasya, over Yeşil Irmak: 2 spans. Length 34·2 metres (2×17·1 m.); width 9 metres; roadway 6 metres. Foot-path on each side. 1940.
27. BAFRA bridge (fig. 79), Samsun vil., Bafra–Alaçam road, over Kizil Irmak: reinforced concrete, bowstring design, 7 spans. Length 251 metres (7 ×35 m.). 1937.
28. TERME bridge, Samsun vil., Samsun–Ünye road, over Terme Su at Terme: reinforced concrete, 3 spans (15·0 m.+20·0 m.+15·0 m.). Width 6 metres; roadway 5·4 metres. Piers rest on foundations of reinforced concrete piles 0·25 m.×0·25 m. in section. 1939.
29. ÇARŞAMBA bridge, Samsun vil., Samsun–Çarşamba road, over Yeşil Irmak: 12 spans. Length 74 metres (10×6 m.+2×7 m.). 1931.
30. MILIÇ bridge, Samsun vil., Samsun–Ünye road, over Miliç Dere: reinforced concrete, bowstring design. Length 32 metres; width 4 metres; roadway 3 metres. Piers rest on wooden piles. 1939.
31. AKÇAY bridge, Ordu vil., Samsun–Ünye road, over Ak Çay: reinforced concrete, 3 spans (3×30 m.). Width 4 metres; roadway 3 metres. 1939.
32. AKÇAOVA bridge (fig. 80), Ordu vil., Samsun–Ordu road, over Akçaova Dere: reinforced concrete, 5 spans. Length 81·5 metres (15·0 m.+16·5 m.+18·5 m.+16·5 m.+15·0 m.). 1934.
33. ELEKÇI bridge, Ordu vil., Samsun–Ordu road, over Elekçi Dere:

reinforced concrete, 3 spans. Length 64 metres (20 m.+24 m.+20 m.). 1934.

34. CURIDERE bridge, Ordu vil., Samsun–Ordu road, over Curi Dere: reinforced concrete, 5 spans. Length 81·5 metres (15·0 m.+16·5 m.+18·5 m.+16·5 m.+15·0 m.). 1934.
35. CEVIZDERE bridge, Ordu vil., Samsun–Ordu road, over Ceviz Dere: reinforced concrete, 3 spans. Length 64 metres (20 m. +24 m.+20 m.). 1934.
36. BOLAMAN bridge (fig. 81), Ordu vil., Samsun–Ordu road, over Bolaman Dere: reinforced concrete, bowstring design, single span of 65 metres. Length 75 metres. 1936.

    The Bolaman valley is here 285 metres wide. Normally, even during the flood season, the river does not cover more than 70 metres width. Occasionally, perhaps once in from 5 to 10 years, the flood may be heavier and there may be some danger to the bridge.
37. FADLI bridge (fig. 85), Tokat vil., Niksar–Reşadiye road, over Kelkit Irmak: reinforced concrete, single arch of 36 metres. Length 54 metres; roadway 6 metres. 1937.
38. AŞAĞIKALE bridge, Sivas vil., Koyulhisar–Niksar road, over Kelkit Irmak: main span 36 metres. Width 4 metres; roadway 3 metres. 1939.
39. YUKARIKALE bridge, Sivas vil., Sivas–Koyulhisar–Ordu road, over Kelkit Irmak: 3 spans (10 m.+45 m.+10 m.). Width 4 metres; roadway 3 metres. 1939.
40. AKÇAAĞIL bridge (fig. 86), Giresun vil., Suşehri–Koyulhisar road, over Kelkit Irmak: reinforced concrete, bowstring design, 2 spans. Length 70 metres (2×35 m.); roadway 4 metres. 1933.
41. ÇANAKKALE bridge, Çanakkale vil., Çanakkale–Balikesir road, over Ince Su. Length 25 metres. 1931.
42. SEKLIK bridge, Çanakkale vil., Çanakkale–Balikesir road, over Seklik Dere: 3 spans. Length 42 metres (3×14 m.). 1931.
43. ÇANDERE bridge, Çanakkale vil., Çanakkale–Balikesir road, over Çan Dere: 6 spans. Length 120 metres (6×20 m.). 1931.
44. NIŞANKAYA bridge, Çanakkale vil., Çanakkale–Balya road, over Saricaeli Dere: 2 spans. Length 36 metres (2×18 m.). 1932.
45. MÜSTECAP bridge, Balikesir vil., Çanakkale–Balya road, over Müstecap Dere: 3 spans. Length 36·8 metres (2×12·0 m. +12·8 m.). 1931.
46. KÜÇÜK AGONYA bridge, Balikesir vil., Çanakkale–Balya road,

over Küçük Agonya Dere: 3 spans. Length 24 metres (3×8 m.). 1931.

47. BÜYÜK AGONYA bridge, Balikesir vil., Çanakkale–Balya road, over Büyük Agonya Dere: 3 spans. Length 78 metres (3×26 m.). 1931.

48. ARSLAN bridge (fig. 90), Çanakkale vil., Çanakkale–Ezine–Bayramiç road, over Sarmisak Çay (Küçük Menderes): reinforced concrete, stone piers, 5 spans (3 over the river, 2 carrying the bridge to level ground). Length 90 metres (11·6 m.+18·0 m.+17·5 m.+16·4 m.+11·5 m.). 1935.

49. YAHYAKÖY bridge, Balikesir vil., Balikesir–Susurluk–Bursa road, over Simav river: reinforced concrete girders, 3 spans. Length 78 metres (24 m.+30 m.+24 m.); width 6·0 metres; roadway 5·4 metres. 1938.

50. KARADERE bridge, Balikesir vil., Balikesir–Bandirma road, over Kara Dere: reinforced concrete, 6 spans. Length 90 metres (6×15 m.); width 6·0 metres; roadway 5·4 metres. 1937.

51. HANIFIDERE bridge (fig. 91), Bursa vil., Karacabey–Bandirma road, over Simav river: reinforced concrete, 3 spans. Length 40·7 metres (12·88 m.+15·25 m.+12·57 m.); width 5·7 metres; roadway 5·2 metres. 1940.

52. HASANPAŞA bridge, Bursa vil., Bursa–Karaköy road, over Hasanpaşa Dere: reinforced concrete, 9 straight spans. Length 97·4 metres (9×10 m.). 1936.

53. YALOVA bridge, Kocaeli vil., at Yalova, over Samanli Dere: reinforced concrete, plain girder, 3 spans (8 m.+10 m.+8 m.). Width 9 metres; roadway 7·5 metres. 1939.

The bridge is on the road which connects the baths with the landing-stage and the town. Increasing popularity of this health resort made it necessary to replace the former wooden bridge.

54. SAMANLIDERE bridge, Kocaeli vil., at Yalova, on the road joining the baths to the town, over the Samanli Dere: reinforced concrete, foundations on wooden piles, 2 spans each of 16·2 metres. Width 9 metres; roadway 7·5 metres. 1939.

55. YALAKDERE bridge (fig. 92), Kocaeli vil., Yalova–Karamürsel road, over Yalak Dere: reinforced concrete, 3 spans, central span bowstring. Length 53 metres (10·0 m.+22·5 m.+10·0 m.); roadway 4·8 metres. 1936.

56. VEZIRHAN bridge, Bilecik vil., Bilecik–Gölpazari road, over Sakarya river: 2 spans. Length 90 metres (2×45 m.). 1932.

57. YENIKÖY bridge, Bilecik vil., Bilecik–Söğüt road, over a tributary of the Kara Su: reinforced concrete, straight girders, 3 spans (13·00 m.+16·25 m.+13·00 m.). Width 6 metres; roadway 5·4 metres. 1939.
58. GÜNGÖRMEZ bridge, Balikesir vil., Balikesir–Edremit road, over Güngörmez Dere: 5 spans. Length 85·4 metres (3×23·8 m. +2×7·0 m.). 1930.
59. KARINCADERE bridge (fig. 93), Balikesir vil., Burhaniye–Ayvalik road on the outskirts of Burhaniye town, over Karinca Dere: reinforced concrete, 7 straight spans. Length 74·92 metres (7×10 m.). 1937.
60. ALTINOVA bridge, Balikesir vil., Izmir-Ayvalik road over Altinova stream: reinforced concrete, 3 spans. Length 42·25 metres (13·00 m. +16·25 m.+13·00 m.); width 6·0 metres; roadway 5·4 metres. 1938.
61. BAKIRÇAY bridge, Izmir vil., Izmir–Bergama road, over Bakir Çay: 2 spans. Length 53 metres (2×26·5 m.). 1931.
62. GÜZELHISAR bridge, Izmir vil., Izmir–Bergama road, over Güzelhisar Çay: 11 spans. Length 121 metres (11×11 m.). 1927.
63. MENEMEN bridge (fig. 94), Izmir vil., Izmir–Bergama coast road, over Gediz river, north of Menemen: reinforced concrete, bowstring design, 5 spans. Length 160 metres (31·30 m.+ 3×32·47 m.+31·30 m.); roadway 5·4 metres. 1935.
64. DEĞIRMENDERE bridge, Izmir vil., Muradiye–Menemen road, over Değirmen Dere: reinforced concrete girders, 3 spans. Length 60 metres (18·75 m.+22·50 m.+18·75 m.); roadway 5·4 metres. 1938.
65. KUMÇAY bridge, Manisa vil., Saruhanli–Ahmetli road, over Kum Çay. Length 72·8 metres. 1931.
66. ADAGIDE bridge, Izmir vil., Ödemiş–Adagide road, over Küçük Menderes: 3 spans. Length 78 metres (3×26 m.). 1925.
67. KALABAKA bridge, Aydin vil., Aydin–Çine road, over Kalabaka Dere. Length 68 metres. 1931.
68. DAMLAÇAY bridge, Aydin vil., Aydin–Çine road, over Damla Çay: 3 spans. Length 84 metres (2×27·8 m.+28·4 m.). 1931.
69. NAZILLI bridge, Aydin vil., Nazilli–Bozdoğan road, over Büyük Menderes river: length 72 metres. 1931.
70. AKÇAY bridge, Aydin vil., Nazilli–Bozdoğan road, over Akçay Dere: 5 spans. Length 175 metres (5×35 m.). 1928.

71. SARAYKÖY bridge, Denizli vil., Denizli–Boldan road, over Büyük Menderes river: 3 spans. Length 80 metres (2×25 m.+30 m.). 1927.
72. AKÇAY bridge, Muğla vil., Muğla–Denizli road, over Ak Çay: reinforced concrete, 6 spans. Length 110 metres (15 m.+4×20 m.+15 m.); width 6 metres; roadway 5·5 metres. Under construction in Oct. 1940.
73. NAMNAM bridge, Muğla vil., Muğla–Köyceğiz road, over Namnam Çay: reinforced concrete, 8 straight spans (8×15 m.). Width 4 metres; roadway 3 metres. 1939.
74. DALAMAN bridge (fig. 96), Muğla vil., Muğla–Fethiye road, over Dalaman river: reinforced concrete, bowstring design, 3 spans. Spans large to allow timber to be floated down the river when in flood. Length 107 metres (3×35 m.); width 4·5 metres; roadway 3 metres. 1936.
75. AKSU bridge, Antalya vil., Antalya–Manavgat road, over Ak Su: length 110 metres. 1933.
76. MANAVGAT bridge, Antalya vil., Antalya–Alanya road, over Manavgat Çay at Manavgat: 3 spans. Length 80 metres (8·5 m.+60·0 m.+11·0 m.). 1932.
77. KELOĞLU bridge, Içel vil., Tarsus–Adana road, over Keloğlu Dere. Length 25 metres. 1932.
78. KÖRKÜN bridge (fig. 99), Seyhan vil., Adana–Karaisali road, over Körkün (Gürgün) tributary of the Seyhan: reinforced concrete, single bowstring span of 72·48 metres. Roadway 3·6 metres. 1934.
79. CEYHAN bridge, Seyhan vil., at Ceyhan town, over Ceyhan river: reinforced concrete piers, iron superstructure, 4 spans (15 m.+80 m.+2×22 m.). Middle span Langer girder construction; others are straight girders. Width 10 metres; roadway 6 metres; foot-paths (2 m.) on the overhang on each side. Piers and superstructure completed 1941, remainder under construction.
80. KARASU bridge, Gaziantep vil., Kilis–Islâhiye road, over Kara Su: reinforced concrete, 2 straight spans (2×10 m.). Width 4 metres; roadway 3 metres. 1940.
81. GÜVERCINLI bridge, Gaziantep vil., Islâhiye–Tahtaköprü road, over Güvercinli stream: reinforced concrete, 3 spans. Length 29·20 metres (3·65 m.+21·90 m.+3·65 m.); roadway 3 metres. 1941.
82. AFRIN bridge (fig. 103), Gaziantep vil., Kilis–Islâhiye road, over

Afrin Su: reinforced concrete, single arch of 36 metres. Length 54 metres; roadway 6 metres. 1937.

83. AKSU bridge, Maraş vil., Maraş–Eloğlu road, over Ak Su: reinforced concrete, 7 spans (13·5 m.+5×17·0 m.+13·5 m.). Width 6·0 metres; roadway 5·4 metres. 1939.

The two piers on the Maraş side rest on sand and gravel, the rest are on reinforced concrete piles. The bridge links the chief town of the vilâyet with the railway.

84. SUÇATI bridge, Maraş vil., Maraş–Kayseri road, over Kayagözü Dere: reinforced concrete, 3 spans, main span 42 metres. Width 6·0 metres; roadway 5·4 metres. 1939.

85. TEKIR bridge (fig. 101), Maraş vil., Maraş–Kayseri road, over Tekir Dere: reinforced concrete, single arch (21·9 metres). Width 6·0 metres; roadway 5·4 metres. 1939.

86. ALIKAYA bridge (fig. 102), Maraş vil., Maraş–Kayseri road, over Göksun (?): reinforced concrete, main arch 42 metres. Width 6·0 metres; roadway 5·4 metres. 1939.

87. PORSUK bridge, Kütahya vil., Kütahya–Afyonkarahisar road, over Porsuk Çay. Length 82·3 metres. 1930.

88. KOYUNAĞLI bridge, Ankara vil., Ankara–Beypazari–Sariköy road, over Sakarya river. Length 81·7 metres. 1932.

89. ONUNCUYIL bridge (fig. 67), Ankara vil., Ankara–Beypazari road, over Kirmir Çay 88 km. from Ankara: reinforced concrete, 8 spans. Length 116·2 metres; width 4 metres. 1934.

90. OVAÇAY bridge (fig. 71), Ankara vil., Ankara–Gerede road, over Ova Çay 57 km. from Ankara: reinforced concrete, 7 spans. Length 80 metres (7×10 m.); roadway, with foot-paths, 6 metres. 1936.

Formerly this road after crossing the Zir bridge turned off the Ayaş road. This detour is now avoided by the new road, which shortens the distance by 10 km.

91. ETIMESUT bridge, Ankara vil., Ankara–Etimesut (Etimesğut) road, over Ankara Çay. Length 40 metres. 1926.

92. ORMAN ÇIFTLIĞI bridge, Ankara vil., at the Gazi Orman Çiftliği, over Ankara Çay. Length 25 metres. 1926.

93. ETLIK bridge, Ankara vil., Ankara–Etlik road, over Çubuk Çay: 3 spans. Length 36 metres (2×10·5 m.+15·0 m.). 1927.

94. ZIRAAT bridge, Ankara vil., Ankara–Keçiören road, over Çubuk Çay: 3 spans. Length 36·0 metres (2×10·5 m.+15·0 m.). 1927.

95. ÇUBUK bridge, Ankara vil., Ankara–Çubuk road, over Çubuk

Çay near Çubuk town: reinforced concrete girders, 4 spans. Length 35·4 metres (7·7 m.+2×10 m.+7·7 m.). 1936.

96. TÜNEY bridge (fig. 74), Ankara vil., Ankara–Çankiri road, over Tüney (Terme) Çay, 106 km. from Ankara: reinforced concrete girders, 7 spans. Length 70 metres (7×10 m.); roadway 3 metres; two foot-paths, each 0·3 metres. 1935.

97. KARABEKIR bridge, Ankara vil., Çerikli–Sungurlu–Çorum road, over Delice Su: reinforced concrete, bowstring design, single span of 32 metres. Roadway 3·0 metres; two foot-paths, each 0·5 metres. 1935.

A very useful bridge, on the shortest route from Çorum to Ankara and the Sungurlu district; it also connects with the railway.

98. ARAPSUN bridge, Niğde vil., Arapsun–Kirşehir road, over Kizil Irmak at Arapsun: reinforced concrete, 5 spans. Length 131·30 metres (23·75 m.+26·50 m.+30·00 m.+26·50 m.+23·75 m.). 1934.

99. AVANOS bridge, Kirşehir vil., Kirşehir–Avanos road, over Kizil Irmak. Length 160 metres. 1926.

100. ÜRGÜP bridge, Kayseri vil., Kayseri–Ürgüp road, over Damsa Çay: reinforced concrete, 4 straight spans (15·4 m.+20 m.+15 m.+40 m.). Width 6·0 metres; roadway 5·4 metres. Piers on Kayseri side on reinforced concrete piles, others on solid rock. 1939.

101. SARIOĞLAN bridge, Kayseri vil., Kayseri–Sivas road, over Sarioğlan Dere: 3 spans. Length 30 metres (3×10 m.). 1930.

102. BOZKURT bridge, Sivas vil., Şarkişla–Akçakişla road, over Kizil Irmak. Length 142 metres. 1938.

103. GÖKSU bridge (fig. 108), Malatya vil., Adiyaman–Besni–Gölbaşi road, over Gök Su: extremely strong reinforced concrete construction, locked into the banks in solid rock, 3 spans (34·6 m.+35·0 m.+34·6 m.). Length 118·2 metres including small side-spans; roadway 4 metres. 1935.

104. MEMIKÂN bridge (fig. 107), Malatya vil., Malatya–Elâziz road, over Memikân or Şişman Çay: reinforced concrete, 6 spans. Length 64·6 metres (6×10·0 m.). 1937.

105. ISMETPAŞA bridge (fig. 106), Malatya vil., Malatya–Elâziz road, over Firat Su: reinforced concrete, one main arch, 2 subsidiary spans on each side. Length 157 metres (2×12 m.+109 m.+2×12 m.). 1932.

106. HACIKÂMIL bridge, Urfa vil., Urfa–Siverek–Diyarbekir road:

reinforced concrete girders, foundation embedded in solid rock, concrete roadway laid on girders, 3 spans. Length 50·8 metres (15·4 m.+20·0 m.+15·4 m.); width 6 metres; roadway 5·4 metres. 1937.

107. AMBARÇAYI bridge, Diyarbekir vil., Diyarbekir–Silvan–Bitlis road, over Ambar Çay: reinforced concrete, 9 spans (9× 15 m.). Width 6·0 metres; roadway 5·4 metres. 1939.

Foundations on layer of hard clay below the 3–4 m. layer of sand and pebbles on the stream bed.

108. GARZAN bridge (fig. 57), Siirt vil., Garzan–Diyarbekir road, over Garzan Su: masonry, length 36 metres. 1924.

The first bridge built under the Republic.

109. PISYAR bridge (fig. 109), Siirt vil., Diyarbekir–Hazo–Bitlis road, over Garzan Su: 3 spans, main arch 45 metres long. Width 3·9 metres; roadway 3·0 metres. 1941.

110. GEZER bridge (fig. 110), Siirt vil., Siirt–Diyarbekir road, over Gezer Su, 9 km. from Siirt: stone construction, 4 spans. Length 54·7 metres (4×10 m.); roadway 4 metres. 1934.

The bridge was reconstructed, the central piers being sunk to solid rock.

111. PAŞOR bridge (fig. 111), Siirt vil., Siirt–Diyarbekir road, over Paşor Su, 18 km. from Siirt: reinforced concrete, single arch of 50·4 metres. Length 74·4 metres; roadway 3·7 metres. 1934.

112. KÜLÜŞKÜR bridge (fig. 116), Elâziz vil., Elâziz–Palu–Çapakçur road, over Murat Su, 53 km. from Elâziz: reinforced concrete, bowstring design, 5 spans. Length 180 metres (5×36 m.); width 5·0 metres; roadway 4·5 metres. 1939.

113. ALIŞAM bridge, Elâziz vil., Elâziz–Palu road, over Harinke Dere: reinforced concrete, 3 straight spans. Length 42·25 metres (13·00 m.+16·25 m.+13·00 m.); width 6·0 metres; roadway 5·4 metres. 1939.

114. CIPÇAYI bridge, Elâziz vil., Elâziz–Kebanmadeni road, over Cip Çay: reinforced concrete, 2 spans (2×20 m.). Width 4 metres; roadway 3 metres. 1939.

115. ŞEHSU bridge, Tunceli vil., Pertek–Mazkirt road, over Monzur Su: iron girder, lattice construction, piers of iron with reinforced concrete base, pier on Pertek side rests on rock, that on Mazkirt side on sand and pebbles. Length 70 metres; width 4·5 metres; roadway 3·5 metres. 1940.

116. PERTEK bridge (fig. 119), Tunceli vil., Elâziz–Tunceli road, over

Murat Su: reinforced concrete, single arch of 106·2 metres. Width 5·5 metres; roadway 4·8 metres. 1939.

Replaces the old wooden bridge (span 216 metres) 5 km. away, which was swept down in 1929.

117. SINGEÇ bridge (fig. 117), Tunceli vil., Elâziz–Hozat road, over Murat Su: reinforced concrete, single arch of 36 metres. Length 54 metres; width 5·6 metres; roadway 4·8 metres. 1938.

118. KEBANMADENI bridge (fig. 120), Elâziz vil., Elâziz–Kebanmadeni–Arapkir road, over Firat Su (Euphrates) at Kebanmadeni: reinforced concrete girders, 6 spans. Length 112 metres (3 × 10 m. + 62 m. + 2 × 10 m.); width 4·5 metres; roadway 3·7 metres. It is possible for one car to pass another drawn in to the side. 1937.

119. KOZLUK bridge, Malatya vil., Malatya–Kemaliye–Erzincan road, over Arapkir Su: iron girder, lattice construction. Length 40 metres; width 4·3 metres; roadway 3·5 metres. Iron superstructure completed, and rest nearing completion in 1941.

120. ŞIRZI bridge, Malatya vil., Malatya–Kemaliye–Erzincan road, over Firat Su: iron superstructure, 3 spans. Width 4·5 metres; roadway 3·5 metres. Iron superstructure completed, and rest nearing completion in 1941.

121. ILIÇ bridge (fig. 121), Erzincan vil., Erzincan–Kemaliye–Elâziz road, over Firat Su: iron lattice girder on central span, simple girders on side spans, timber roadway, 3 spans. Length 68 metres (12 m. + 36 m. + 12 m.). 1937.

122. KEMAH bridge (fig. 118), Erzincan vil., Malatya–Kemah–Erzincan road, over Firat Su on outskirts of Kemah: single-span suspension bridge, steel cable suspension, timber roadway. Length 53·5 metres; width 4·0 metres; roadway 2·4 metres. 1937.

The first modern suspension bridge in Turkey.

123. HORASAN bridge (fig. 115), Erzurum vil., Trabzon–Persia transit road, over Aras river: bowstring design, 3 spans. Length 110 metres (3 × 36 m.); width 5·5 metres; roadway 4·5 metres. 1940.

124. BORÇKA bridge (fig. 114), Çoruh vil., Hopa–Borçka–Kars road, over Çoruh Irmak 36 km. from Hopa: steel construction, single span of 113 metres, roadway of wood on metal supports. 1935.

This bridge has the largest span in Turkey. It is very vulnerable.

New or Reconstructed Wooden Bridges, 1942

European Turkey

Tekedere bridge, Kirklareli vil., Kirklareli–Polos road, over Inece (Teke) Dere. 6 spans (6×10 m.); on piles.

Black Sea Coastlands

Kuruçay bridge, Amasya vil., Amasya–Tokat road. 7 spans (7×7 m.); side piers masonry, middle on piles.

Reşadiye bridge, Tokat vil., Niksar–Reşadiye road, over Kelkit Çay. 2 spans (21·5 m.+14·0 m.); masonry piers.

Alişam bridge, Tokat vil., Erbaa–Samsun road. 9 spans (9×10 m.); side piers masonry, middle on piles.

Taşlidere bridge, Rize vil., Rize–Pazar road. 17 spans (17×7 m.); on piles.

Öküz bridge, Kocaeli vil., Izmit–Adapazari road. 3 spans (3×5·6 m.); side piers masonry, middle on piles.

Akçay bridge, Kocaeli vil., Izmit–Geyve road, over Ak Çay. 7 spans (7×7 m.); side piers masonry, middle on piles.

Istanbul Deresi bridge, Kocaeli vil., Izmit–Sapanca road. 5 spans (5×7 m.); side piers masonry, middle on piles.

Western Anatolia

Sariçay bridge, Çanakkale vil., Çanakkale–Ezine road. 20 spans (20×8 m.); on piles.

Ak Köprü bridge, Çanakkale vil., Biğa–Karabiğa road, over Yakacik Dere. 15 spans (12×5 m.+3×8 m.); side piers masonry, middle on piles.

Bayramiç bridge, Çanakkale vil., Bayramiç–Gölcük road, over Küçük Menderes. 8 spans (2×12 m.+6×15 m.); concrete piers.

Menderes bridge, Çanakkale vil., Sariçali–Geyikli road. 13 spans (13×10 m.); on piles.

Ergil bridge, Balikesir vil., Aksakal–Manyas road, over Kara Dere. 10 spans (10×5 m.); on piles.

Yeniköy bridge, Balikesir vil., Aksakal–Manyas road. 10 spans (10×8·25 m.); side piers masonry, middle on piles.

Değirmendere bridge, Balikesir vil., Balikesir–Dursunbey road. 12 spans (12×7 m.); on piles.

Kepsut bridge, Balikesir vil., Balikesir–Kepsut road. 10 spans (10×19 m.); on piles.

ULUABAT bridge, Bursa vil., Bursa–Karacabey road. 15 spans (15×9 m.); side piers masonry, middle on piles.

KÖPRÜHISAR bridge, Bursa vil., Bursa–Bilecik road, over Gök Su. 6 spans (2×5·5 m.+4×6·5 m.); side piers masonry, middle on piles.

ULU bridge, Bursa vil., Karacabey–Bugaz road. 7 spans (7×8·4 m.); side piers masonry, middle on piles.

BAKLACIK bridge, Manisa vil., Alaşehir–Kula road. 6 spans (6×7 m.); side piers masonry, middle piers timber.

Southern Coastlands

GÖZSÜZÇE bridge, Içel vil., Gilindire–Anamur road. 4 spans (4×9 m.); on piles.

EKBEZ bridge, Gaziantep vil., Islâhiye–Hassa road. Single span, 15 metres; masonry piers.

South-east Turkey

KULPDERE bridge, Diyarbekir vil., Kulp–Muş road. 2 spans (2×17 m.); masonry piers.

Eastern Turkey

KÜPKIRAN bridge, Ağri vil., Karaköse–Van road, over Murat river. 13 spans (13×7 m.); on piles.

TUTAK bridge, Ağri vil., Karaköse–Van road. 14 spans (14×9 m.); on piles.

NORDOZ bridge, Van vil. Single span, 18·4 metres; side piers masonry.

FIRAT bridge, Erzincan vil., Erzincan–Erzurum road. 2 spans (2×26·2 m.); masonry piers.

DÜLGÂH bridge, Erzurum vil., Oltu–Kars road. 17 spans (17×8 m.); on piles.

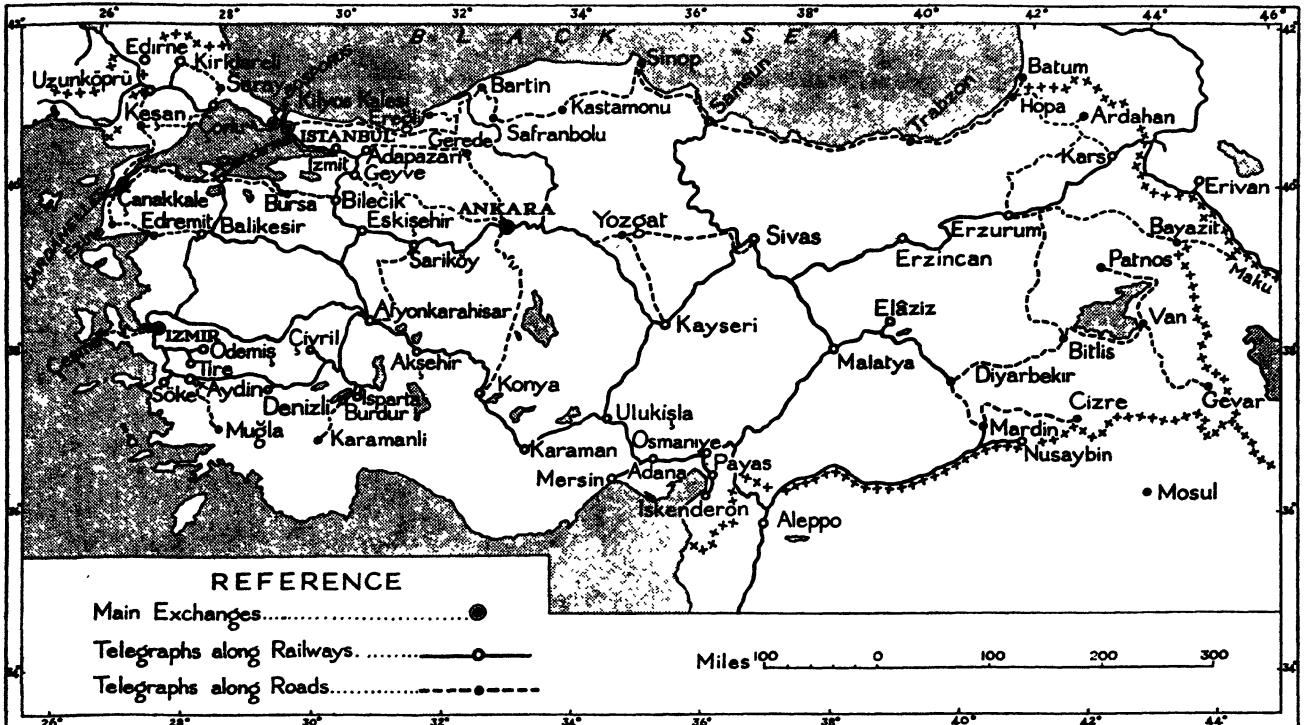


FIG. 122. *Main telegraph lines and stations*

III. SIGNAL COMMUNICATIONS

THE Turkish system of signal communications comprises telegraph and telephone (both overhead), submarine cables, and wireless; there are no underground cables. By 1940 the Turkish Government had not yet brought these various communications completely up to date, and therefore, while parts of them are excellent, other parts are primitive. The submarine cables cross the Straits efficiently in several places, but several have been abandoned under the Black Sea or the Mediterranean.

Telegraph and Telephone (*fig. 122*)

The State lines are maintained and operated under the Director of Posts, Telegraphs, and Telephones; but there are also small country telephone systems not connected to the main system, and not under him, for local service with the police. Probably telegraphs and telephones follow all the railways, though this is only known for certain between Istanbul and Çorlu and between Izmir and Susiğirlik, and from Ankara the Turkish State Railways operate a network of open-wire lines. The army also has its own telephone system at defended ports, such as Çanakkale and Izmir, and operates local exchanges at military headquarters throughout the country, using country lines.

At present the simplex morse operates between Adana, Ankara, Balikesir, Erzurum, Giresun, Istanbul, Sivas, and seventeen other towns; teleprinters are employed between Ankara, Istanbul, and four other towns; Hughes type-printing telegraph between Ankara, Istanbul, and nine other towns in Turkey and Constanza, Salonika, Sofia; phantom or superimposed circuits (telegraph on telephone) between Ankara, Istanbul, and four other towns. There is little doubt that these last three methods will develop as the Turkish system expands.

South of the Sea of Marmara all telegraph-poles are of the 'Lily of the Valley' type, without arms, except on the railway line from Izmir to Susiğirlik. Here the poles are made of steel rails with wooden tops lashed on. Information is lacking about the rest of Turkey, but the 'Lily of the Valley' type is probably used.

It was reported that in 1939 there were 20,000 telegraph lines (aerial) at Ankara, and over 20,000 telephone lines at Ankara, Istanbul,

and Izmir. Cable lines totalled 1,175 miles in the same year.

There are automatic telephone exchanges only at Ankara, Istanbul, and Izmir; elsewhere operators are necessary for exchanges, some of which are very old.

In 1939 the number of lines, supplied by Ericssons except in Istanbul and its suburbs, where they are provided by Rotary, were:

Ankara Main	3,000
,, Yenişehir	2,000
,, War Ministry	400
Istanbul Main	4,800
,, Beyoğlu	5,600
,, Kadiköy	1,200
Izmir	3,000
,, Karşiyaka	260
33 private exchanges	990

The number has no doubt changed in these towns since 1939, and eleven more automatic exchanges in other places were to be completed by September 1941, but there is no information available yet if this work has been carried out.

It cannot be said whether operators and mechanics throughout the country are skilled. Stores can only be obtained in large towns such as Ankara, Istanbul, and Izmir, and a few of the smaller towns.

Submarine Cables

Cables have been laid as follows:

Black Sea. A cable laid in 1877 crosses from Kilyos Kalesi to Odessa.

Bosporus. Several cables cross from Cape Rumeli and the Golden Horn estuary to the Asiatic shore.

Sea of Marmara. In the Kartal area cables connect the Princes' islands with one another and with Maltepe Burun on the mainland.

Dardanelles. Cables cross from Nağra Kalesi to Boğali Kalesi, from Çam Kalesi to Köse Kalesi, and from Gelibolu to Çardakova point.

Eastern Mediterranean. Cables connect Marmaris and Rhodes. British cables between Çeşme and Khios were cut in 1941.

Cables from Kilyos Kalesi to Constanza were laid in 1905 but abandoned in 1935; British cables from Kartal to Nağra Kalesi were laid in 1878 and abandoned in 1934; a British cable from Kepez to Tenedos (Bozcaada) was laid in 1878 and has since been picked up;

there is an abandoned cable between Tenedos and Beşike bay; the British cable laid from Tenedos to Lemnos in 1878 was abandoned in 1934 and the Lemnos end picked up.

Wireless Stations

The long-wave civil stations at Ankara (250 kW.) and Istanbul (25 kW.) are to be taken over by the navy on the outbreak of war. Because of its power and range the Ankara station is considered the most suitable for working to naval ships. It has superseded the old broadcasting station at Istanbul, which has, however, been kept serviceable. There is a wireless school at Izmit for officers, petty officers, and men.

A list of wireless stations is given on p. 512, but army stations have not been shown as they are liable to be changed. At present Telefunken sets are generally used in the army, all of standard but obsolete German patterns. It was said in 1940 that equipment was to be expanded and modernized by adding tank and armoured-car transmitters and receivers, portable pack sets for men and mules, medium and heavy mobile stations for lorry transport, the latter transported complete in a lorry, for auto-transmission and reception, and heavy mobile stations for more permanent installation.

Apart from the existing or proposed wireless stations, the following Telefunken sets are worked in a group: Çanakkale, Çorlu, Istanbul, Izmir, Muğla. There is also a similar network in eastern Turkey and an organization linking Ankara with all corps headquarters. Recent details are not available, but in 1938 the following was the military network: Ankara (G.H.Q.), Bitlis (2nd division), Elâziz (Harput district), Erzincan, Erzurum, Hinis, Istanbul, Kastamonu, Mardin, Osmaniye, Van, Zonguldak. These were on a medium wave-length except Ankara and Istanbul, where the wave-length was short.

The Air Force stations are run on a schedule basis, three times a day, at Çorlu, Diyarbekir, Eskişehir, Izmir, Kütahya. Kayseri sometimes joins this organization. The wave-length is short throughout. A German mobile aircraft set with a Telefunken transmitter is used. Aircraft are fitted with different wireless sets according to whether they are of British, American, French, or German manufacture.

Civil aviation is not on a large scale. There are commercial airfields at Ankara, Edirne, Istanbul, Van, and Yeşilköy, and possibly at Izmir, Giresun, Seddülbahir, Turhal. The Turkish Government has approved a programme to bring the civil air radio service up to date and has ordered a number of modern wireless stations. It is

hoped that as well as Ankara and Yeşilköy some of the other commercial stations may also be supplied with these modern sets.

TABLE

Wireless Stations

Name of station	*Position (if known)*	*Wavelength: long, medium, or short*	*Power in kW. or range (if known)*	*Owner*	*Remarks*
AKÇAŞEHIR (AKÇAKOCA)	41° 05′ N. 31° 08′ E. (at the port)	1 medium	..	Naval station	Reported working in 1938; no other details.
ANKARA	..	12 short	1 kW., range 600 miles for telegraphy. 0·235 kW., range 150 miles for telephony	Naval station	Marconi transmitter, working to Izmit, Çanakkale, Istanbul, and warships, as well as to military and air stations.
ANKARA	39° 57′ N. 32° 52′ E. Reception at Gölbaşi on the road to Lake Tuz.	2 long	250	Posts and telegraphs	Commercial. Meteorological bulletins.
ANKARA	Some distance from the previous station, exact place unknown.	5 short	..	..	Commercial. Interior service with Edirne, Diyarbekir, Istanbul, and Van.
ANKARA AERADIO	39° 55′ N. 32° 46′ E.	1 medium 1 short	1 0·4	Aeronautical station	No fixed hours of service.
ANKARA (ETIMESUT)	39° 54′ N. 32° 42′ E.	1 medium 2 short	60 20	Broadcasting station	Owing to geographical conditions the range is poor. Transmitters are modern, made by Marconi, with three pairs of 400-foot masts.
BÜYÜKLIMAN (VAKFIKEBIR)	41° 12′ N. 29° 06′ E.	3 medium	..	Coast station	Entrance to Bosporus. The passage of foreign ships is signalled.
ÇANAKKALE	40° 09′ N. 26° 24′ E.	1 medium	0·5	Coast station	National defence.
ÇANAKKALE	On east side of the Dardanelles	1 medium 1 short	Range 200 miles Range 700 miles is being installed	Naval station	Works to Ankara.
DIYARBEKIR	37° 55′ N. 40° 15′ E.	4 short	..	Posts and telegraphs	Interior service to Ankara, Istanbul, and Van.
EDIRNE	41° 40′ N. 26° 45′ E.	1 short	..	Posts and telegraphs	Commercial. Interior service with Ankara.
GIRESUN	40° 50′ N. 38° 24′ E. (at the town)	..	..	..	Commercial. No further details since 1938.
GÖLCÜK (SW. of Izmit)	..	1 medium 1 short	Range 200 miles Range 1,000 miles	Naval station	Interior service to Ankara. These transmitters are being installed (1942). It is reported that four W/T masts are nearing completion.

Name of station	*Position (if known)*	*Wave-length long, medium or short*	*Power in kW. or range (if known)*	*Owner*	*Remarks*
ISTANBUL .	41° 04′ N. 28° 57′ E.	1 long 2 short	25 20	Main posts and telegraphs	Commercial. Services with Baghdad, Berlin, U.S.A., Paris, London, Teheran, Rome, Warsaw, Bucarest, Berne, and Moscow.
ISTANBUL .	..	..	..	Posts and telegraphs	Commercial. Situated in one of the suburbs, but not used at present. It is believed to be taken over by the army.
ISTANBUL .	..	5 medium 1 short	..	..	Commercial. Interior service with Ankara Diyarbekir and occasionally Lemnos.
ISTANBUL .	41° 04′ N. 28° 57′ E.	2 medium	3	Coast station	24 hours' service.
ISTANBUL .	41° 12′ N. 28° 52′ E.	..	Marconi transmitter at Osmaniye	Broadcasting station	No active broadcasting, however, from Istanbul.
ISTANBUL .	At the Italian Embassy	1 short		Broadcasting station	Reception only from S. Paolo Rome, using a secret call sign.
IZMIR . .	38° 24′ N. 27° 06′ E. (at the town)	2 short	..	..	Commercial, at the head of the gulf. It was stated in 1940, however, that there is now no station here.
RUMELI FENERI	41° 14′ N. 29° 07′ E.	1 medium	150 nautical miles	Radio beacon, and fog signal station	..
SEDDÜLBAHIR	On Gelibolu (Gallipoli) peninsula near Eceabat	1 medium	..	..	Commercial. No further details since 1938.
TURHAL .	40° 25′ N. 36° 05′ E.	..	..	..	Commercial. No further details available.
VAN . .	38° 28′ N. 43° 21′ E.	4 short	..	Posts and telegraphs	Commercial. About one mile south of Lake Van. Works to Ankara and Diyarbekir.
YEŞILKÖY AERADIO	28° 55′ N. 41° 00′ E.	1 medium 1 short	1 0·4	Aeronautical station	No fixed hours of service. A recent report states that it is now used for coastal ships as well. A new coastal ship station is shortly to be built.

Military and military air stations are not shown on this table as they are liable to alter.

APPENDIX A

POPULATION OF TOWNS

THE census population of the main towns in 1935 is given below; where available, the estimated figures for 1940 are shown in brackets; figures are to the nearest 50. The vilâyets of the smaller towns are given for identification; ports (P) are described in Chapter XII; notes on all towns with a population of over 10,000, and of others with less (shown with an asterisk), are given in the Alphabetical Gazetteer of Towns (Appendix B).

Towns and their Population

Over 100,000	*1935*	*(1940)*
Istanbul (p. 20)	741,150	(789,350)
Izmir (P)	170,950	(184,350)
Ankara (p. 28)	122,700	(155,550)
100,000–50,000		
Adana	76,450	(90,000)
Bursa	72,200	(77,350)
Eskişehir	47,050	(60,600)
Gaziantep	50,950	(57,300)
Konya	52,100	(56,700)
Kayseri	46,200	(53,900)
50,000–30,000		
Edirne	36,100	(45,150)
Diyarbekir	34,650	(43,250)
Sivas	33,900	(41,250)
Malatya	27,300	(38,000)
Manisa	30,900	(37,700)
Zonguldak (P)	20,600	(37,400)
Samsun (P)	32,500	(36,900)
Erzurum	33,100	(36,400)
Urfa	31,700	(34,850)
Trabzon (P)	29,700	(33,050)
Maraş	29,400	(30,700)
Mersin (P)	27,600	(30,200)

30,000–20,000	*1935*	*30,000–20,000*	*1935*
Antakya	28,000	Turgutlu	21,700
Balikesir	26,700	Tokat	21,250
Adapazari	24,850	Akhisar	21,200
Kilis	24,600	Kirklareli	20,900
Tarsus	24,400	Ödemiş	20,750
Afyonkarahisar	24,150	Tire	20,450
Elâziz	23,200	Tekirdağ (P)	20,350
Antalya (P)	23,000	Çorum	20,150
Mardin	22,500		

20,000–15,000	*1935*
Izmit (P)	18,700
Isparta	18,450
Kars	18,050
Kütahya	17,800
Uşak	17,550
Denizli	17,350
Erzincan	16,150
Siirt	16,050
Zile	15,150
Siverek	15,150
Aydin	15,100
15,000–10,000	
Bergama	14,850
Mustafa Kemalpaşa	14,800
Rize (P)	14,700
Nevşehir	14,150
Kirşehir	14,050
Iskenderon (P)	14,000
Giresun (P)	13,950
Kastamonu	13,800
Yozgat	13,650
Burdur	13,600
Menemen	13,400
Bandirma (P)	13,300
Ayvalik (P)	13,100
Inegöl	13,100
Merzifon	13,050
Edremit	12,550
Niğde	12,400
Nazilli	12,000
Amasya	12,000
Çorlu	11,800
Çanakkale (P)	11,500
Lüleburgaz	11,500
Muğla	11,000
Söke	10,900
Iskilip	10,700
Bayburt	10,350
Akşehir	10,350
Adiyaman	10,300
Bafra	10,250
Ceyhan	10,200
Ordu (P)	10,100
Develi	10,100
Tosya	10,050
10,000–5,000	
Bitlis*	10,000
Urla—Izmir	9,950
Çankiri*	9,750
Gönan—Balikesir	9,700
Birecik*—Urfa	9,650

10,000–5,000	*1935*
Bayindir*—Izmir	9,650
Ereğli*—Konya	9,550
Uzunköprü*—Edirne	9,450
Van*	9,350
Bor*—Niğde	9,300
Karacabey*—Bursa	9,250
Bolvadin—Afyonkarahisar	9,200
Salihli*—Manisa	9,150
Karaman*—Konya	9,050
Bartin (P)—Zonguldak	8,850
Kirkağaç*—Manisa	8,700
Kula*—Manisa	8,600
Osmaniye*—Seyhan	8,600
Alaşehir*—Manisa	8,400
Yalvaç—Isparta	8,350
Aksaray—Niğde	8,350
Besni-Malatya	8,200
Sandikli*—Afyonkarahisar	8,150
Milas*—Muğla	8,100
Şebinkarahisar*—Giresun	7,950
Bozüyük*—Bilecik	7,850
Bolu*	7,850
Sarikamiş*—Kars	7,700
Boldan—Denizli	7,650
Nizip—Gaziantep	7,600
Midyat*—Mardin	7,500
Biğa—Çanakkale	7,500
Yenişehir—Bursa	7,100
Çarşamba*—Samsun	7,050
Gümüşhaciköy—Amasya	7,000
Erbaa—Tokat	6,950
Keşan—Edirne	6,900
Arapkir*—Malatya	6,800
Tavas—Denizli	6,750
Ermenek*—Konya	6,750
Iğdir*—Kars	6,750
Darende—Malatya	6,650
Niksar*—Tokat	6,650
Gelibolu (P)—Çanakkale	6,650
Düzce*—Bolu	6,500
Elbistan—Maraş	6,350
Vize—Kirklareli	6,300
Karaköse*—Ağri	6,250
Sivrihisar—Eskişehir	6,100
Demirci—Manisa	5,950
Zara—Sivas	5,950
Gemlik (P)—Bursa	5,900
Divrik*—Sivas	5,900
Simav*—Kütahya	5,850
Kuşadasi (P)—Izmir	5,850
Bender-Ereğli (P)—Zonguldak	5,850
Ünye (P)—Ordu	5,800

10,000–5,000 (cont.)	*1935*
Eğridir*—Isparta	5,750
Beypazari*—Ankara	5,750
Vezirköprü—Samsun	5,600
Burhaniye (P)—Balikesir	5,600
Lice*—Diyarbekir	5,600
Safranbolu*—Zonguldak	5,600
Susiğirlik*—Balikesir	5,550
Gediz*—Kütahya	5,550
Cizre*—Mardin	5,500
Bayramiç*—Çanakkale	5,500
Kağizman—Kars	5,400
Tavşanli*—Kütahya	5,350
Hayrabolu—Tekirdağ	5,300
Sungurlu—Çorum	5,250
Malkara—Tekirdağ	5,250
Babaeski—Kirklareli	5,200
Muş*	5,150
Alanya (P)—Antalya	5,100
Inebolu (P)—Kastamonu	5,100
Silifke*—Içel	5,050
Kozan*—Seyhan	5,050
Mudanya (P)—Bursa	5,050
5,000–4,000	
Hendek*—Kocaeli	4,950
Seferihisar—Izmir	4,900
Sinop (P)	4,850
Karapinar—Konya	4,850
Çatalca*—Istanbul	4,850
Keskin*—Ankara	4,800
Uluborlu—Isparta	4,700
Erdek (P)—Balikesir	4,700
Ezine—Çanakkale	4,700
Elmali—Antalya	4,550
Bodrum (P)—Muğla	4,550
Gürün—Sivas	4,450
Kartal (P)—Istanbul	4,450
Seydişehir—Konya	4,400
Bulancak (P)—Giresun	4,400
Avanos—Kirşehir	4,400
Ürgüp*—Kayseri	4,400
Sarayköy*—Denizli	4,250
Emirdağ—Afyonkarahisar	4,250
Gerede*—Bolu	4,250
Osmancik*—Çorum	4,200
Dinar*—Afyonkarahisar	4,200
Bilecik*	4,100
Akçaabat (P)—Trabzon	4,100
Bozdoğan—Aydin	4,050
Korkuteli—Antalya	4,000
4,000–3,000	
Tirebolu (P)—Giresun	4,000

4,000–3,000	*1935*
Bucak—Burdur	3,950
Karacasu—Aydin	3,950
Taşköprü—Kastamonu	3,950
Bünyan—Kayseri	3,950
Çeşme (P)—Izmir	3,900
Pasinler—Erzurum	3,900
Saideli—Konya	3,900
Incesu*—Kayseri	3,850
Şarki Karaağaç—Isparta	3,850
Lâdik*—Samsun	3,850
Dörtyol—Seyhan	3,850
Fethiye (P)—Muğla	3,850
Soma*—Manisa	3,800
Boyabat—Sinop	3,750
Kemalpaşa*—Izmir	3,750
Erciş—Van	3,700
Boğazliyan—Yozgat	3,700
Palu*—Elâziz	3,650
Silivri (P)—Istanbul	3,650
Şirnak—Siirt	3,600
Çine—Aydin	3,600
Mucur—Kirşehir	3,550
Kemaliye*—Malatya	3,550
Gerze (P)—Sinop	3,550
Kalecik—Ankara	3,500
Artvin*—Çoruh	3,500
Akseki—Antalya	3,500
Dikili (P)—Izmir	3,400
Havza*—Samsun	3,400
Ilgin*—Konya	3,400
Şarköy (P)—Tekirdağ	3,350
Sürmene (P)—Trabzon	3,300
Dursunbey—Balikesir	3,300
Ergani-Osmaniye—Diyarbekir	3,250
Ayaş—Ankara	3,200
Emet—Kütahya	3,200
Şarkişla—Sivas	3,200
Gördes—Manisa	3,200
Gümüşane*	3,150
Saray—Tekirdağ	3,150
Çerkeş*—Çankiri	3,150
Çermik—Diyarbekir	3,100
Gebze—Kocaeli	3,100
Derik—Mardin	3,050
Suşehri—Sivas	3,050
Polatli—Ankara	3,050
Koçhisar—Ankara	3,000
3,000–2,500	
Çivril—Denizli	2,950
Ulukişla*—Niğde	2,900
Göksun—Maraş	2,900
Pinarbaşi—Kayseri	2,900

3,000–2,500 (cont.)	1935
Hopa (P)—Çoruh	2,900
Fatsa (P)—Ordu	2,900
Mecitözü—Çorum	2,850
Ardahan*—Kars	2,850
Viranşehir—Urfa	2,800
Gercüş—Mardin	2,800
Hekimhan—Malatya	2,750
Erganimadeni*—Elâziz	2,750
Foça (P)—Izmir	2,750
Akçaşehir (P)—Bolu	2,750
Savur—Mardin	2,750
Karamürsel—Kocaeli	2,750
Balya—Balikesir	2,750
Geyve*—Kocaeli	2,700
Silvan—Diyarbekir	2,700
Ahlat—Van	2,700
Demirköy—Kirklareli	2,700
Çumra—Konya	2,700
Çal—Denizli	2,700
Terme (P)—Samsun	2,700
Mudurnu—Bolu	2,650
Devrek—Zonguldak	2,650
Yalova (P)—Kocaeli	2,650
Orhangazi—Bursa	2,650
Beyşehir—Konya	2,600
Tefenni—Burdur	2,600
Marmaris (P)—Muğla	2,600
Yildizeli (Yenihan)—Sivas	2,600
Sindirği—Balikesir	2,550
Kadirli—Seyhan	2,550
Ayancik (P)—Sinop	2,550
Söğüt—Bilecik	2,500

2,500–2,000	
Iznik*—Bursa	2,500
Kandira—Kocaeli	2,450
Sürüç—Urfa	2,450
Alaca—Çorum	2,400
Daday—Kastamonu	2,350
Hozat—Elâziz	2,300
Islâhiye—Gaziantep	2,300
Kemah*—Erzincan	2,300
Lapseki (P)—Çanakkale	2,300
Sorgun—Yozgat	2,250
Ipsala—Edirne	2,250
Acipayam—Denizli	2,250
Pütürge—Malatya	2,200
Akdağmadeni—Yozgat	2,150
Cihanbeyli—Konya	2,150
Osmaneli—Bilecik	2,150
Koyulhisar—Sivas	2,150
Pertek—Elâziz	2,150
Görele (P)—Giresun	2,100

2,500–2,000	1935
Karasu (P)—Kocaeli	2,100
Akçadağ—Malatya	2,050
Ilgaz—Çankiri	2,000
Torbali—Izmir	2,000

2,000–1,500	
Kelkit—Gümüşane	2,000
Kangal—Sivas	2,000
Hafik—Sivas	2,000
Nusaybin*—Mardin	1,950
Anamur (P)—Içel	1,900
Oltu*—Erzurum	1,850
Gölpazari—Bilecik	1,850
Çemişgezek—Elâziz	1,850
Bayazit*—Ağri	1,850
Imroz—Çanakkale	1,850
Pazar (P)—Rize	1,850
Eşme—Manisa	1,850
Mihaliççik—Eskişehir	1,850
Hinis—Erzurum	1,800
Şile (P)—Istanbul	1,750
Gevaş—Van	1,750
Arapsun—Niğde	1,750
Cide (P)—Kastamonu	1,750
Seyitgazi—Eskişehir	1,750
Eceabat (P)—Çanakkale	1,700
Bozcaada (P)—Çanakkale	1,700
Çubuk—Ankara	1,650
Ayvacik—Çanakkale	1,650
Mut—Içel	1,600
Mesudiye—Ordu	1,550
Bulanik—Muş	1,550
Çölemerik*—Hakâri	1,550
Göynük—Bolu	1,550
Haymana—Ankara	1,500
Reşadiye—Tokat	1,500
Ispir*—Erzurum	1,500
Eleşkirt—Ağri	1,500

1,500–1,000	
Tortum—Erzurum	1,450
Nallihan—Ankara	1,450
Kavak—Samsun	1,350
Bozkir—Konya	1,350
Datça (P)—Muğla	1,350
Küre—Kastamonu	1,300
Kâhta—Malatya	1,250
Tuzluca—Kars	1,250
Tercan—Erzurum	1,250
Finike (P)—Antalya	1,250
Orhaneli—Bursa	1,250
Başkale*—Van	1,200

1,500–1,000 (cont.)	*1935*
Yaylak—Urfa	1,200
Köyceğiz—Muğla	1,200
Mazkirt—Elâziz	1,200
Malazkirt—Ağri	1,200
Vakfikebir (P)—Trabzon	1,200
Posof—Kars	1,200
Yüksekova—Van	1,200
Pazarcik—Gaziantep	1,150
Sason—Muş	1,150
Kizilcahamam—Ankara	1,150
Of (P)—Trabzon	1,150
Hilvan—Urfa	1,100
Kavakli—Edirne	1,100
Torul—Gümüşane	1,050
Kiği—Erzincan	1,050
Kâzimpaşa—Van	1,050
Gülnar—Içel	1,050
Kulp—Diyarbekir	1,000
Plümür—Erzincan	1,000
Under 1,000	
Çapakçur*—Bingöl	950
Manavgat*—Antalya	950
Andifli (P)—Antalya	850
Karaburun (P)—Izmir	750
Borçka*—Çoruh	600

APPENDIX B

ALPHABETICAL GAZETTEER OF TOWNS

ADANA (Seyhan; *class.* Adana). 36° 59′ N., 35° 18′ E.; alt. 95 ft. (rly. stn.). Seyhan vil. cap. Pop. 90,000 (1940). Banks (Agricultural, Business, Ottoman). Consulates (British, German). Bourse. Hospital. Malaria commission centre. Meteorological station. Railway stations (2). Hotels (8). Garages (6). Large electric power-house.

The town is on the right bank of the Seyhan R., spreading to the slopes of a low hill, about 25 miles from the sea. The ancient city was an important military and commercial centre, with masonry bridge, probably built by Justinian, 220 yards long, over the river, and ruined castle of Ḥarun-ar-Rashid, built in 782 at the bridge-head on the right bank.

The town is prosperous. Main streets are fairly wide, straight, and well kept. Larger houses are of sun-dried brick, with two stories and flat roofs. Behind the main streets is a network of narrow winding lanes with houses of wood and mud. The principal mosque, Ulu Cami, dates from 1542.

Climate. Winter is wet and mild (Dec. mean daily minimum, 36° F.), with occasional frost and cold N. winds; summer is dry and hot (Aug. m.d. max. 94° F.), with S. winds. Average annual rainfall 24 inches (16·5 between November and March). Residents often migrate to the hills during the hot season. Drinking-water from the river and from wells.

Trade and Resources. Foreign trade is through the port of Mersin. The fertile Seyhan plain produces cotton, cereals (especially wheat), citrus and other fruits, vegetables, sugar-cane, sesame, and some tobacco, honey, and wool. Drainage and irrigation works are being built (p. 160); water-wheels supply the gardens. Modern methods and machinery are commoner than in most other parts. There are three agricultural research stations, several private cotton-mills, a State weaving factory, and cotton-seed crushing plant; flour-mills, saw-mills, foundries, tanneries, and abattoir; factories for olive-oil, soap, tobacco, and explosives.

Communications. Adana is on the old 'Baghdad Railway' (route 9), with branch from Yenice to Mersin (route 19), and is thus in direct touch with the Central Plateau and with SE. Turkey. The old station is at W. end of the town; modern station 3 miles N. of town with first-class buildings and facilities.

Good motor-road to Tarsus, Mersin, and thence along coast to Silifke, and from Tarsus by 'Cilician Gates' to Central Plateau. Other roads E. and SE. are only roughly metalled and may be bad.

Flat-bottomed boats can generally reach Adana, where the river has an average depth of 4 feet and a current of 3 miles an hour.

Military wireless station. Civil and military airfield, liable to become waterlogged in winter; on commercial air routes to Ankara and Konya.

ADAPAZARI (Ada Bazar). 40° 46′ N., 30° 23′ E.; alt. *c.* 150 ft. Kocaeli vil.: kaza. Pop. 24,850 (1935). Banks (Agricultural, Business, Ottoman). Hotels (2). Electricity station (medium). Meteorological station.

The town is on the low-lying fertile plain of Ak Ova, W. of the Sakarya R. and E. of the Yavaş (Çark) stream which leads from Sapanca lake to the Sakarya. The town is open, and houses stand in gardens. The climate is healthy.

Adapazari is a market for grain (especially wheat), fruit, vegetables, eggs, silk, tobacco, leather, and walnut wood. Drainage and irrigation are being improved (p. 155). There are two large flour-mills and small silk industry. Iron, lead, and zinc ores are mined in Çam Dağ to the E.

Communications. Terminus of 5-mile branch-line from Arifiye on Haydarpaşa–Eskişehir railway (route 2). Main motor-road (with telegraph) goes E. by a series of ovas through Hendek, Bolu, and Gerede to Ankara, and is continued beyond Gerede to Ilgaz, whence the N. coast can be reached at several points through Kastamonu. A metalled road goes S. to Geyve, on the Üsküdar–Beypazari–Ankara road, and a cart-track N. to Incili.

ADIYAMAN (Adityman, Adiaman, Husnimansur; *class.* Carbanum, Perre, Pordonnium). 37° 45′ N., 38° 19′ E.; alt. 2,380 ft. Malatya vil.: kaza. Pop. 10,300 (1935).

The site is a crater, S. of and below a steep outlier of the Anti-Taurus. There are many minarets, a ruined citadel, gardens, orchards, and vineyards. Armenians were massacred or deported 1915–18. Winters are generally mild with some rain, but occasional snow and frost; summers hot, dry, and unhealthy. Water is abundant and good.

No good motor-roads pass through Adiyaman; but one is under construction to Gölbaşi station on the Fevzipaşa–Malatya railway, via Besni. Rough roads lead S. and SE. to the Euphrates at Patas and Samsat, and E. to Kâhta.

AFYONKARAHISAR (Afion Karahissar, Afium Kara Hissar; *class.* Acroënus). 38° 46′ N., 30° 33′ E.; alt. 3,307 ft. (rly. junction). Vil. cap. Pop. 24,150 (1935). Banks (Agricultural, Business, Ottoman). Hospital. Meteorological station. Railway stations (2). Hotels (2). Garages. Museum. Baths. Electricity station (medium).

The town is built at the foot of a bare precipitous volcanic rock, at the summit of which stands the ruined Byzantine citadel of Acroënus, about 650 feet above the plain, and reached by a rock-cut stair. It was an ancient caravan town on the 'Royal Road' from Susa to Sardis and has been greatly improved in recent years with parks laid out and several fine new buildings, including the Railway Station, the Ali Çetinkaya Railway Institute, Post

Office, General Hospital, and Girls' Institute. The winding Akar stream makes the fertile plain marshy in spring (I, photos. 77, 78, p. 162).

Principal products are opium seed and oil, which give the town its name ('Opium black castle'). There are flour-mills and trade in cereals, sugar-beet, mohair, wool, dyes, rugs, felt and leather goods, furs and skins, inlaid woodwork, eggs, bees-wax, and honey; also mineral waters from springs in the neighbourhood. There is a grain silo (5,000 tons).

Communications. Railways to Haydarpaşa and Ankara via Eskişehir (routes 8, 2, 3); to Bandirma and Izmir via Balikesir (routes 16, 15); to Izmir by Uşak (route 14) and by Aydin (route 17); to Burdur, Isparta, and Eğridir (routes 17, 18); and to Konya and the E. (route 8). The two stations ('town' and 'junction') are about one mile apart, but are connected.

Metalled roads follow most of these lines for some distance, and there is a close network of unmetalled cart-roads passable for cars in the dry season.

AKHISAR (*class.* Thyatira; *Greek*, Axari). 38° 55′ N., 27° 51′ E.; alt. 331 ft. (rly. stn.). Manisa vil.: kaza. Pop. 21,200 (1935). Banks (Agricultural, Business). Meteorological station. Hotels (3). Electricity station (medium).

The town is in the plain of the upper Kum (Gördük) tributary of the Gediz, among orchards and gardens, commanded by the ruined fort which gives its name ('white castle'). It was one of the 'Seven Churches of Asia' (*Revelation* ii. 18). Most houses are of wood.

It is a commercial and industrial town, trading in cloth, tobacco, and cereals. The neighbourhood produces cereals, olives, sesame, grapes; live-stock, wool, and hides; opium, valonia, cotton, tobacco.

Communications. Railway N. to Balikesir and Bandirma; S. to Manisa and Izmir (routes 14, 15). Motor-roads to Bergama by Soma, and to Izmir by Manisa; cart-tracks to Sindirği and to Gördes.

AKŞEHIR (Ak Shehr; *class.* Philomelium). 38° 21′ N., 31° 20′ E.; alt. 3,274 ft. (rly. stn.). Konya vil.: kaza. Pop. 10,350 (1935). Banks (Agricultural, Ottoman). Hotel. Electricity station (medium).

The town, at the foot of the Sultan Dağ, 6 miles from the Akşehir salt lake, was important in the past as a Pergamene fort, then as a Seljuk military centre, and until the fourteenth century, as it is on the plateau route between Konya and Afyonkarahisar. Two Seljuk mausoleums, a Seljuk seminary, and some ancient mosques remain, some in ruins. The streets are narrow and the suburbs dilapidated. The Akşehir stream flows down a ravine behind the town; the plain is marshy, but there are large irrigated gardens, and water is plentiful from springs.

The town is a market for opium, rugs, silk cocoons, wool and mohair, cereals, dairy produce, fish (from the lake), and livestock; and has a grain silo (1,000 tons).

Communications. Station *c.* 1½ miles NE. of town on railway from Afyonkarahisar to Konya (route 8); the dry-weather road between these two places passes through the town with a branch to the station. A motor-road across the Sultan Dağ to Eğridir is under construction.

ALAŞEHIR (Ala Shehr; *class.* Philadelphia). 38° 21′ N., 28° 32′ E.; alt. 620 ft. (rly. stn.). Manisa vil.: kaza. Pop. 8,400 (1935). Electricity station (small).

The town is in an amphitheatre beneath the wooded Tmolus foothills bordering the broad Koca valley; its ruined walls and towers stand amid irrigated gardens and orchards, with the medieval citadel on a spur. There are good houses in the suburbs, and hot mineral springs to the E. Water is good and plentiful.

The rich volcanic soil is excellent for grain, fruit, vegetables, valonia, and liquorice. Cloth is woven.

History. The town was founded by Attalus Philadelphus, king of Pergamum (241–197 B.C.), and was strategically important because of its position near the head of the Gediz trough and of its command of several routes. It was one of the 'Seven Churches of Asia' (*Revelation* iii. 7). It has suffered much from Byzantine, Mongol, and Turk invaders, and from earthquakes.

Communications. The Izmir–Afyonkarahisar railway (route 14) leaves the Gediz trough at Alaşehir, crosses the Koca, and immediately begins the difficult ascent to the plateau. An important motor-road goes SE. to Sarayköy for Antalya; Kula, in the hills to N., is also connected by motor-road.

AMASYA (*class.* Amasia). 40° 39′ N., 35° 51′ E.; alt. 1,283 ft. (rly. stn.). Vil. cap. Pop. 12,000 (1935). Bank (Agricultural). Museum. Hotels (2). Meteorological station. Electricity station (small).

The town is in a deep gorge of the Yeşil Irmak near its confluence with the Tersakan Su, among rich gardens. On the left bank the precipitous castle rock rises 1,000 feet above the river, bare and jagged, with double peak crowned by a large castle, refortified by Ala-ed-Din (A.D. 1219–36). In the rock face below are tombs of the kings of Pontus (2–3 centuries B.C.). Amasya was their capital, the birth-place of Strabo the geographer, and a free city under Pompey after 65 B.C. It was frequented by the early sultans, the Büyük Timurlenk gate with sculptured decoration recalling Tamerlane's seven-months' siege (1402). There is a fine mosque built by Bayazid II (1481–1512). The town was remodelled by Zia Pasha, poet of the 'Young Turks' in the early years of the present century, but it suffered severely in the earthquake of 1939, when over 1,800 houses were wholly or partially destroyed and over 600 people killed (I, photos. 49–51, pp. 112–13).

There is a large bazaar and a good *han*, but the district suffers from floods and malaria. There are extensive poppy-fields, fruit of all kinds is abundant, especially 'English' apples and pears. Wine is made, and good wheat grown in the plain above the gorge. There are four flour-mills.

Communications. Amasya is on the Sivas–Samsun railway (route 12) and on the projected northern motor-road and railway from Adapazari to Erzurum. At present there are motor-roads to Samsun via Merzifon and Havza, and to Niksar and Sivas by Tokat.

ANTAKYA (Antioch: *class.* Antiochia). 36° 11′ N., 36° 10′ E.; alt. 344 ft.
The Hatay: kaza. Pop. 28,000 (1935). Electricity station (medium).

The town is on the left bank of the Orontes (Asi), here from 60 to 80 yards wide with steep banks up to 10 feet high, and crossed by a stone bridge of 4 arches. It is built on an extremely fertile plain at the western foot of a crag, 'Mount Silpius', which rises 1,200 feet above it. Along the heights are towers 30 feet square, on the line of the ancient walls. The modern town is within the walls and straggles for 2 miles along the river-bank (photo. 117). The narrow streets, many impassable for wheels, have fairly broad side-walks, separated from the roadway by a deep trough for garbage. Plans to regulate the river and to drain the Amik marshes have been approved, and work began on them in 1941.

The many orchards of the plain are irrigated by water-wheels. Figs, millet, cotton, and maize are extensively cultivated. The chief industries are the making of soap, olive-oil, and silk, and the rearing of silk-worms.

Throughout the summer cool winds blow from the sea up the valley of the Asi, and the town is generally healthy.

History. Antioch was founded as a Greek city by Seleucus I of Syria in 300 B.C., and greatly enlarged by his successors Antiochus I and III; replacing Seleucia in 240 as capital. But it became more Oriental than Greek, and its Aramaic-speaking populace was dissolute and turbulent. It suffered severely from earthquakes, but had many fine Roman buildings. Converts of SS. Peter, Paul, and Barnabas were 'first called Christians' at Antioch (*Acts* xi. 26), which became a Patriarchate like Jerusalem and Alexandria; the most famous of its Church Synods was in A.D. 341. In 538 the city was destroyed by Chosroes I. Rebuilt by Justinian, it was taken by Saracens in 635, by Seljuks in 1084, by Crusaders in 1098, and again destroyed by Beibars in 1268.

Communications. There is no railway. Antakya is on the Fevzipaşa–Süvediye motor-road, which has branches W. to Iskenderon and E. to Aleppo.

ARAPKIR (Arabkir; *class.* Arabacis). 39° 02′ N., 38° 30′ E.; alt. *c.* 4,000 ft.
Malatya vil.: kaza. Pop. 6,800 (1935).

The town is about 15 miles W. of the Euphrates where it cuts a passage

S. to join the Murat R. There is an old castle and Seljuk mosque; the old town (Eskişehir) is about 2 miles NW. There is a small trade in cotton, fruit, and silk. Cart-roads lead S. to Malatya, SE. to Elâziz by the Keban bridge over the Euphrates, and N. to Kemaliye and the Sivas–Erzurum railway.

ARDAHAN. 41° 07′ N., 42° 42′ E.; alt. *c.* 5,900 ft. Kars vil.: kaza. Pop. 2,850 (1935). Bank (Agricultural).

A small town on the Kur (or Koran) R., of considerable importance because of its position on the roads from Batum and Hopa to Kars, and its command of the road to Ahilkelek in Russian territory. Another road leads SW. through Oltu to Erzurum. The valley is here about 3½ miles wide with gently sloping sides.

ARTVIN (formerly cap. of Kutais prov., Russian Armenia). 41° 11′ N., 41° 49′ E.; alt. *c.* 630 ft. (market-place). Çoruh vil. cap. Pop. 3,500 (1935). Bank (Agricultural). Meteorological station.

The town is on the left bank of the Çoruh R., on the steep wooded lower slopes of Kevap (Mersivan) Dağ. The houses are arranged in tiers up the hill-side (photo. 118) and are reached by a winding road leading from the bridge over the Çoruh to the market-place. In 1894 the population was 6,000, mostly Armenians; few were left after the War of 1914–18. The former size is explained by the commanding position on the road between Batum and Kars, important before the Russians pacified Transcaucasia and built the railway to Alexandropol (Leninakan). Dyes used to be made and 'Artvin Red' had a considerable reputation. To-day forest produce, olives, tobacco, walnuts, figs, vegetables, and livestock make up some trade, which, however, has little importance. The main motor-road from Hopa and Batum to Ardahan and Kars passes high up on the other side of the Çoruh, and is reached by a winding branch fit for motors. The river is navigable with some difficulty by flat-bottomed *kayiks* below Artvin, also for a short distance above the town.

AYASOLUK (Selçuk; *class.* Ephesus). 37° 58′ N., 27° 22′ E.; alt. 62 ft. (rly. stn.). Izmir vil.

Once the capital of the Roman province of Asia, Ephesus is on the S. side of the lower Küçük Menderes plain, N. of the gap between M. Messogis and the Samsun Dağ. The present village is mean and malarious. E. of the detached hill on which stand the Turkish castle and the Church of S. John the Divine (*Agios Theologos*, hence Ayasoluk) are the railway station (Selçuk), the hotel, and Roman aqueduct. W. of this hill are the mosque of Isa Bey (A.D. 1390) and the Temple of Artemis ('Diana of the Ephesians'). To the SW., sheltered by the steep N.–S. ridge of the Bülbül Dağ (M. Corissus), is the town of ancient Ephesus, with theatre, baths, and other

buildings between the W. face of its citadel, M. Prion, and the harbour, now 6 miles inland and silted by the river which flows close to the S. margin of the plain (I, photo. 61, p. 136).

History. Ephesus was founded by Ionian Greeks and acquired wealth and fame through its Temple of Artemis. Later it became capital of the Roman province of Asia, and one of the 'Seven Churches' (*Revelation* ii. 1). Its port was silted early and replaced by Scalanova (Kuşadasi).

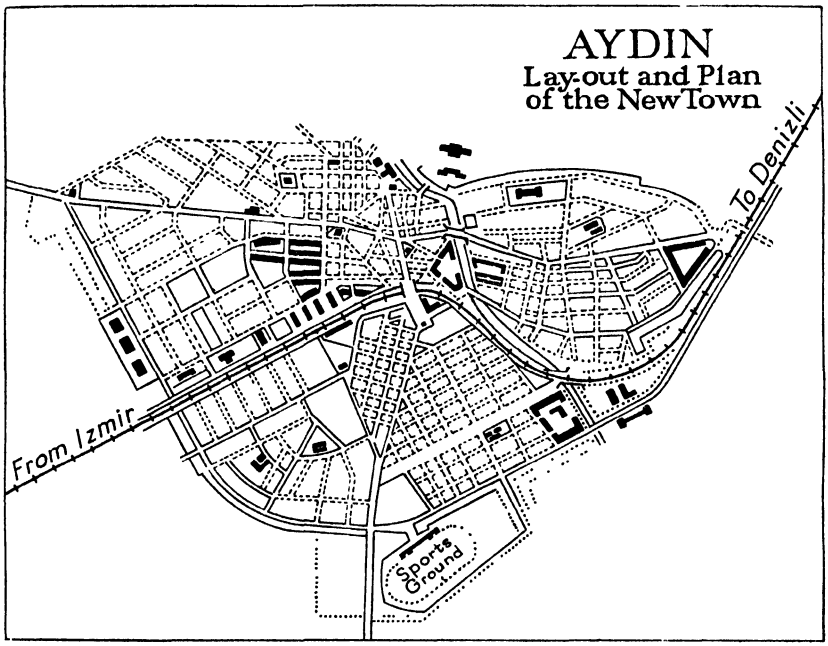


FIG. 123. *Proposed plan of New Aydin (scale not known)*

Selçuk station is on the Izmir–Aydin railway (route 17); from it a motor-road passes by the ruins to the port of Kuşadasi.

AYDIN (Aidin; *class.* Tralles; *arab.* Güzel Hissar). 37° 50′ N., 27° 50′ E.; alt. 217 ft. (rly. stn.). Vil. cap. Pop. 15,100 (1935). Banks (Agricultural Ottoman). Hotel. Meteorological station. Electricity station (medium).

The town, which has its name from its dynasty of Seljuk emirs, 1280–1340, lies at the foot of a terrace of sandy rock (300 ft.) between M. Messogis and the N. edge of the Büyük Menderes plain, W. of the Tabak stream (crossed by the railway and two stone bridges) and opposite the opening of the Çine valley.

On a bluff overlooking the Tabak Çay is the ancient citadel, and west of this, along the terrace, the ruins of Tralles. Below is the old Turkish town,

with bazaar, *hans*, and many fountains. E. of the stream the former Greek quarter occupies the terrace-slope. The district is well cultivated with olives, figs, grapes, and walnuts, and the town is the chief market of the Menderes valley, trading in cereals, cotton, figs, raisins, olive-oil, liquorice, and has leather and weaving industries. The modern town is well built and well laid-out, though far from finished (fig. 123).

Water is plentiful; the site is sheltered in winter, but hot and unhealthy in summer. Malaria has been prevalent.

Communications. Aydin is on the old British-built railway from Izmir to the plateau (route 17) and also on the important motor-road from Izmir across the Büyük Menderes to Çine, Muğla, and the south. An earth road parallel to the railway links Aydin with Sarayköy on the Alaşehir–Antalya road and another goes W. to Pinarbaşi for Kuşadasi.

BAFRA (*class.* Paura). 41° 34′ N., 35° 55′ E.; alt. *c.* 70 ft. Samsun vil.: kaza. Pop. 10,250 (1935). Electricity station (medium).

The town, about 1 mile from the right bank of the Kizil Irmak (*class.* Halys) and 12 miles from the mouth, was founded as a port, with outport at Kumcağiz (*class.* Conopium) on E. of delta, 15 miles distant. The delta is marshy, but the district is well wooded and there are good pastures. Tobacco is grown and caviare is made.

Its importance rests on its position on the coastal road between Sinop and Samsun at the crossing over the Kizil Irmak, which is here spanned by a large reinforced-concrete bridge (fig. 79).

BALIKESIR (Balikesri; *class.* Hadrianutherae). 39° 39′ N., 27° 53′ E.; alt. 430 ft. (rly. stn.). Vil. cap. Pop. 26,700 (1935). Banks (Agricultural, Business, Ottoman). Barracks. Hospital. Hotels (6). Electricity station (medium).

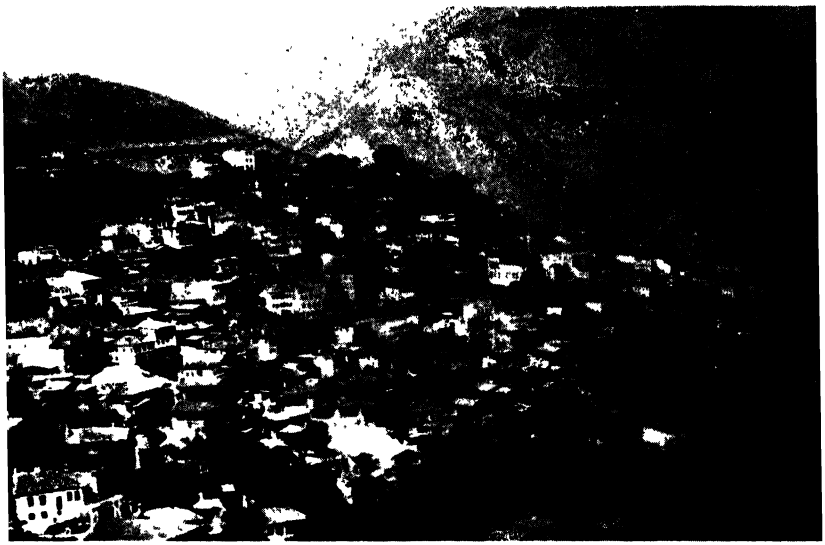
The town, an important road and rail centre, with a permanent garrison, is on gentle slopes on the W. edge of a fertile lowland, 12½ miles from N. to S., 9½ miles from E. to W. A stream, dry in summer, descends N. of the town and drains the plain E. to the Susurluk Çay. There is a large covered bazaar, probably Seljuk, and several mosques, but much was rebuilt after an earthquake in 1896.

There is much cultivation, with gardens, orchards, and vineyards. Cereals, tobacco, opium, and some cotton are grown. There are flour-mills, saw-mills, tanneries, textile factories, iron-works, and a granary (capacity 1,000 tons). Lead, zinc, arsenic, iron and silver ores are mined in the neighbourhood.

The climate is fairly healthy but there is malaria. Provisions are plentiful. Drinking-water is from wells in the town, and from a spring 12½ miles NE., stored in tanks in the town, with pipe to railway-station tanks, generally insufficient in summer.



117. *General view of Antakya (Antioch)*



118. *Artvin*



119. *Bitlis*

Communications. Railways to Bandirma, Izmir, and Eskişehir (routes 15, 14, 16, 8). Motor-roads to Edremit, Çanakkale, Karabiğa, Bandirma, Kepsut, Sindirği, and Soğucak. Airfield at Bostanli, 7 miles SE.

BAŞKALE (Bash Kaleh). Approx. 38° 02′ N., 44° 01′ E.; alt. 7,500 ft. Van vil.: kaza. Pop. 1,200 (1935). Barracks.

The town, 50 miles SE. of Van, and 20 miles from the Persian frontier, is on the W. edge of a cultivated plain which extends 5 miles E. to the Greater Zab (Büyük Zap Su, *loc.* Albak Su). It stands at the foot of a steep range, with houses up the slopes and a ruined Kurdish castle on a spur conspicuous from the road to Çölemerik (Hakâri). The old Turkish barracks, of brick, are in the centre of the town; many houses are well built of sun-dried brick, and the principal streets are fairly clean and wide. The small bazaar is frequented by tribesmen from neighbouring highlands. There are good smiths and carpenters.

The plain is watered by several streams and produces wheat, barley, millet, and sesame. Meadows along the Zab give good grazing in spring and early summer. The winter is severe, with snow lying late; the summer is oppressive.

In 1894 there were some 2,000 houses and a population of 8,680. In 1915 Armenians and Nestorians were massacred or driven out, and the place devastated by both Russians and Turks during the war. It is not known to what extent it has recovered.

Communications. The importance of Başkale arises from its position at the junction of routes from Van to the NW., from Çölemerik to the S., and from Dilman and Urmia (Rizaiyeh) in Persia to the E. The first two are reported to be under reconstruction as motor-roads, or at any rate for wheels.

BAYAZIT (Bayezid, Doğubayazidi). 39° 31′ N., 44° 08′ E.; *c.* 6,560 ft. Ağri vil.: kaza. Pop. 1,850 (1935).

The town stands in the centre of a semicircle of rocky volcanic hills, with Çeşaki Dağ (8,000 ft.) to SW. and Kizil Dağ (8,960 ft.) to E. A fine castle on a hill commands the town, which is mean, with a poor bazaar. The palace, in Persian style, is impressive, but has suffered from war and earthquake.

The position has gained importance from being on the new transit motor-road from Trabzon through Erzurum, Karaköse, and Diyadin into Persia, and is the last place of significance, 10 miles from the boundary. Another road leads N. through Iğdir, Tuzluca, and Kağizman to Kars and Sarikamiş. An aircraft landing-ground is reported.

BAYBURT (Baiburt). 40° 16′ N., 40° 15′ E.; alt. 5,114 ft. Gümüşane vil.: kaza. Pop. 10,350 (1935). Banks (Agricultural, Ottoman).

The town lies on both banks of the Çoruh, in an immense *ova*, enclosed by high ranges: Of Dağ, Vavuk Dağ, and Köse Dağ to N.; Kop Dağ to S.

Houses are of stone with wooden frame and earthen roofs. The massive old Armenian castle is on an isolated precipitous rock W. of the river. After flowing through the town the river enters a rocky gorge by the castle hill. The town acts as market for the surrounding farming district, with shops, agricultural trading firms, mills, and tanneries.

Communications. Bayburt occupies a strategic position on the trunk road from Trabzon by the Zigana and Vavuk passes to the upper Euphrates (Kara Su) and Erzurum. There are a number of tracks which converge on the town from the neighbouring mountains, and one of some importance over the Çakirgöl Dağ to the port of Sürmene on the Black Sea.

BAYINDIR (Baindir). 38° 13′ N., 27° 39′ E.; alt. 300 ft. Izmir vil.: kaza. Pop. 9,650 (1935). Bank (Agricultural). Hotels (3). Electricity station (small).

The town is at the foot of the Tmolus mountains, overlooking the Küçük Menderes plain. Houses are of wood and sun-dried brick, the streets narrow. Water may be scarce in summer, but provisions are plentiful. Mulberries, olives, cotton, figs, grapes, and cereals are cultivated; there is much livestock. Dairy produce, olive-oil and oilcakes, wool, and tobacco are exported.

Communications. Bayindir is on the Ödemiş branch of the Izmir–Aydin railway (route 17). Rough roads lead N. to Turgutlu in the Gediz valley, and E. to the Ödemiş–Tire motor-road, by which Izmir can be reached via Torbali.

BAYRAMIÇ (Bairamich; *class.* Scepsis). 39° 48′ N., 26° 37′ E.; alt. *c.* 300 ft. Çanakkale vil.: kaza. Pop. 5,500 (1935). Electricity station (small).

The town is in the upper valley of the Menderes (*class.* Scamander) R., on a terrace overlooking the stream. The motor-road from Çanakkale through Ezine to Bayramiç has been extended to Yenice on the Çanakkale–Çan–Balikesir road.

BERGAMA (*class.* Pergamum). 39° 07′ N., 27° 11′ E.; alt. 250 ft. Izmir vil.: kaza. Pop. 14,850 (1935). Banks (Agricultural, Business). Hotels (5). Museum. Electricity station (small).

Between the Bergama Çay (*class.* Selinus) and the Kestel Çay (*class.* Ketius), tributaries of the Bakir R., stands the ancient citadel of Pergamum (1,100 ft.), on a strong rocky position, with a neck (950 ft.) only half a mile wide. The ancient city, with terraced temples and vast sculptured altar (now in Berlin), palace, and theatre, occupied the S. slope and spread into the alluvial plain. The Greco-Roman suburbs and later Moslem Greek quarters are on the left bank of the Bergama Çay, the Turkish quarter and bazaars on the right bank, connected by three Roman bridges. The streams are liable to flood.

The plain is fertile, producing olives, cereals, gall-nuts, wax, cotton, valonia, leather, tobacco, livestock, and dairy products. There is carpet weaving and rug-making, and some trade in wine. The town has suffered from earthquake, the latest in 1939, when two-thirds of the houses are said to have been destroyed.

History. Formerly a small Greek city, Pergamum became about 283 B.C. the stronghold of an adventurer, Philetaerus, whose successor Eumenes (263–241) withstood Antiochus II of Syria. Attalus I (241–197) defeated invading Gauls, and became a valuable ally of Rome against Macedon and Syria. Both he and Eumenes II (197–159) made Pergamum a centre of culture and learning, with splendid buildings and sculptures, and territory which included their southern port Attalia (Antalya). This kingdom was bequeathed by Attalus III (138–133) to the Roman People, and Pergamum remained for two centuries administrative centre of the province of Asia.

Though famed for its healing sanctuary of Aesculapius, it became one of the 'Seven Churches' (*Revelation* ii. 12); was taken by the Turks in the fourteenth century, and from the seventeenth to 1825 was the stronghold of the *derebey* family of Kara Osman Oğlu. Since 1878 German excavators have transferred the principal sculptures to Berlin.

Communications. Bergama is connected by motor-road with the coast at Dikili and Izmir, and with the Izmir–Balikesir railway (route 15) at Soma.

BEYPAZARI (Baibazar; *class.* Petobriga). 40° 10′ N., 31° 56′ E.; alt. 2,000 ft. Ankara vil.: kaza. Pop. 5,750 (1935).

The town is on three hills at the mouth of a narrow valley filled with gardens, vineyards, and orchards: its houses are well built. It is on the old main road between Üsküdar and Ankara, by Izmit and Geyve.

BILECIK (Bilejik; *class.* Belocome). 40° 09′ N., 29° 59′ E.; alt. 1,550 ft. (town), 965 ft. (rly. stn.). Vil. cap. Pop. 4,100 (1935). Bank (Agricultural). Hotels (3). Meteorological station. Electricity station (small).

The town lies on rocky hills above the left bank of the Kara Su tributary of the Sakarya, about 13 miles S. of the confluence and at a break in the great Kara Su gorge. The upper part of the town is steep; below are the Government buildings and public garden. There are several mosques dating back to the early Ottoman period. The old Byzantine castle was taken by the Turks in 1299.

Provisions are plentiful, but silk spinning has long been the principal industry. Early in January 1940 the district suffered from earthquake and flood.

Communications. The Haydarpaşa–Eskişehir railway (route 2) passes up the Kara Su gorge E. of the town. Bilecik station is about 5 miles to the S. The road from Bursa through Yenişehir meets that from Gölpazari N. of Bilecik. South of the town it forks; one branch crosses a tributary by the

Yeniköy bridge, going by Söğüt to Eskişehir, the other follows the Kara Su gorge and the railway, crossing the river by the Karaköy bridge, to Bozüyük for Kütahya and Eskişehir.

BIRECIK (Birijik, Birejik; *class.* Apamea). 37° 01′ N., 37° 59′ E.; alt. 1,470 ft. Urfa vil.: kaza. Pop. 9,650 (1935).

The town, about 15 miles N. of the Syrian frontier at Carablus, is on the left bank of the Euphrates, on the slopes of a ravine in a light-coloured limestone cliff, whose summit (400 ft. above the river) commands a wide view of the valley. South of the town is level camping-ground for caravans. Terraces and gardens surround the town, but the few trees are poor. The ancient walls and medieval castle are ruined. Houses are of stone, with two stories and flat roofs; there is a stone-built *han*. Paved streets descend to the Euphrates ferry.

The river at Birecik is 300 yards wide and 5 feet deep—800 yards wide and 8 feet deep in flood, April–May—with current about 3 miles an hour. The left bank approach is the steeper. Ferry-boats carry about eight laden animals. For a note on the navigability of the Euphrates, *see* I, pp. 177–9; for *shaktur*, *see* p. 466.

Resources and Trade. For about 80 miles south the valley produces wheat and barley without irrigation, and much grain was formerly sent down by *shaktur* to Deir-ez-Zor. Other local products were butter, olive-oil, and grapes; there were many sheep, and a camel-raising district southward. The drawing of the boundary at Carablus has restricted these activities. Water from a spring above the castle traverses the town in several streams. Wood fuel comes from up-river.

Communications. Birecik was long the chief crossing-place of the Euphrates, for caravans between Antioch or Aleppo and Diyarbekir or Mosul. But before 1914 the southerly crossings at Carablus (Carchemish) and Tel Ahmar were preferred, and Carablus was chosen for the passage of the Baghdad railway. Birecik has regained some of its lost importance, by being farther from the boundary, but only rough tracks, passable for motors in dry weather, lead from it W. to Gaziantep, E. to Urfa, and S. to the railway (route 21) at Carablus.

BITLIS (*arab.* Badlis). 38° 22′ N., 42° 05′ E.; alt. 4,600 ft. Vil. cap. Pop. 10,000 (1935). Military station (barracks and hospital).

The town is about 12 miles SW. of Lake Van, in the deep valley of the Bitlis Su, which traverses it in cascades from N. to S. It extends also to NW. up a tributary towards the Kümüs suburb around the old Armenian monastery. At the S. end another side valley from the E. contains the scattered Aveh suburb. On an isolated rock in the middle of the town, between the Bitlis and Kümüs streams, is the ruined castle, with Arab remains, and N. of it the flat-topped Gök Meydan spur, with Government

buildings and the barracks (photo. 119). The principal mosque is S. of the castle, and other fine old mosques and shrines have courtyards and gardens. The houses are solidly built of local volcanic rock. The bazaars along the river have been partly cleared for the high road to the south. This crosses the Bitlis Su by a stone bridge, and there are other bridges upstream. Transverse streets are narrow and often steep. Camping ground is limited, but there is open space along the high-road, near a spring ½ mile above the town. Water is abundant, the best coming by pipe from a spring in the Aveh valley; there are also other springs. Fuel comes from the more distant mountains, including the Nemrut Dağ; the nearer hills are mostly bare.

Supplies and Trade. The bazaars supply, besides European textiles and hardware, some rough iron-work and leather goods, and coarse red cloth of local make. Grain is brought by laden animals and bullock cart from the plain of Muş. Exports include hides, skins, furs, wool, gall-nuts, gum-tragacanth, and coarse tobacco.

Climate. The climate is close and hot in summer, but there is much snow in winter. It is healthy on the whole, but there is much rheumatism.

History. Bitlis occupies a strategic position at the northern exit of the historic route between Lake Van and Mesopotamia, and was the scene of the defeat of Suleiman I by the Persians in 1554. There was formerly a British consulate and an American mission, and the town was prosperous before 1914 when there were many Armenians. Massacre and deportations have reduced the population from 40,000 to its present figure, in which the majority are Kurds. It is now a garrison town with a military hospital.

Communications. An important road, possibly fit for motors, goes SW. through the Bitlis defile to Garzan and Diyarbekir. A cart-road follows the pass northwards and then forks; the W. branch goes through Muş and Çapakçur to Elâziz, the E. one leads round the S. shore of Lake Van to Van town, with a short branch to Tatvan on the SW. corner of the lake. A railway under construction from Elâziz through Muş to Tatvan is to pass within a few miles of Bitlis (route 27).

BOLU (Boli; *class.* Claudiopolis). 40° 45′ N., 31° 35′ E.; alt. *c.* 2,500 ft. Vil. cap. Pop. 7,850 (1935). Banks (Agricultural, Ottoman). Hotels (4). Meteorological station. Electricity station (medium).

The town is in the centre of a rich plain (*ova*) watered by the Bolu Su, a tributary of the Yenice (Filyos) river, and is surrounded by gardens. There are warm springs to S. The district is healthy except for some malaria, populous, and well cultivated; it has increased in importance in recent years. Cereals and vegetables are the chief crops. There are flour-mills and saw-mills.

Communications. Bolu is on the new main motor-road between Haydarpaşa and Ankara via Gerede and within easy reach of the Irmak–Filyos railway (route 11) by motor-road to Ismetpaşa station (Bayindir).

BOR. 37° 54′ N., 34° 34′ E.; alt. 3,720 ft. (rly. stn.). Niğde vil.: kaza. Pop. 9,300 (1935). Electricity station (small).

A small town 10 miles SW. of Niğde, which has grown in size since the railway (route 10) was built from Kayseri to Ulukişla. Houses are fairly well built in gardens and orchards. There are two fine mosques and two *hans*. The railway station is 3 miles S. of the town, and a loop from the Kayseri–Ulukişla motor-road passes through both town and station.

BORÇKA (Yeniyol). 41° 22′ N., 41° 40′ E.; alt. 330 ft. Çoruh vil.: kaza. Pop. 600 (1935).

Borçka or Yeniyol is a large village on the left bank of the Çoruh river, where this turns N. to cross the Russian boundary, 9 miles distant. The Çoruh valley is here about ½ mile wide, enclosed by mountains; the river is joined ¾ mile up by the Bağinidara stream on the right bank and 2 miles up by the Murgul stream on the left. The importance of Borçka rests on its position at the junction of roads to Hopa and Batum, the former a motor-road which here crosses the Çoruh by a suspension bridge, and which continues SE. up the Çoruh valley to Artvin, Ardahan, and Kars. There is also a motorable road up the Murgul to the copper mines.

BOZÜYÜK. 39° 54′ N., 30° 02′ E.; alt. 2,428 ft. (rly. stn.). Bilecik vil.: kaza. Pop. 7,850 (1935). Bank (Agricultural). Hotels (2). Electricity station (medium).

The town commands the entrance to the central plateau from the Marmara region (fig. 124). Behind rise bare mountain slopes broken by ravines and caves. Timber is the chief industry and there are large modern sawmills 1 mile N. on the road to Bilecik. There are two flour-mills.

Communications. Bozüyük is on the Haydarpaşa–Eskişehir railway (route 2) and is likely to gain importance when it becomes the junction for the projected railway from Bursa and the Marmara coast. It is on the motor-road from Bursa through Inegöl to Inönü for Eskişehir and Kütahya.

BURDUR (Buldur; *class.* Polydorion). 37° 42′ N., 30° 17′ E.; alt. 3,150 ft. Vil. cap. Pop. 13,600 (1935). Bank (Agricultural). Hotels (3). Barracks. Meteorological station. Electricity station (small).

The old town lies in rolling chalky country, almost desert, about 3 miles SE. of its brackish lake. It has been extended northwards towards the shores, and is well laid out with fine gardens and orchards; the district is malarious.

Principal products are wheat, barley, opium, attar of roses; rugs, handmade textiles, bricks, and tiles; there are also leather and linen industries.

Communications. Burdur is the terminus of a branch line from the Aydin–Eğridir railway (routes 17, 18), of a motor-bus route from Antalya on the S. coast, and of a light motor-road from Fethiye through Tefenni. A dry-weather road links it with the Dinar–Isparta–Eğridir road at Baladiz.

BURSA (Brusa). 40° 11′ N., 29° 04′ E.; alt. 394 ft. (rly. stn.). Vil. cap. Pop. 77,350 (1940). Banks (Agricultural, Business, Ottoman). Bourse. Hotels (22). Museum. Hospitals. Baths. Malaria commission centre. Meteorological station. Electricity station (large).

The city lies dispersed over the lower slopes of a wooded ridge, separated from the main mass of the Keşiş or Ulu Dağ (*class.* Mysian Olympus) by the upper course of the Gök Dere, which turns to cut through this ridge in a deep gorge spanned by the Setbaşi bridge. On either side of this, smaller

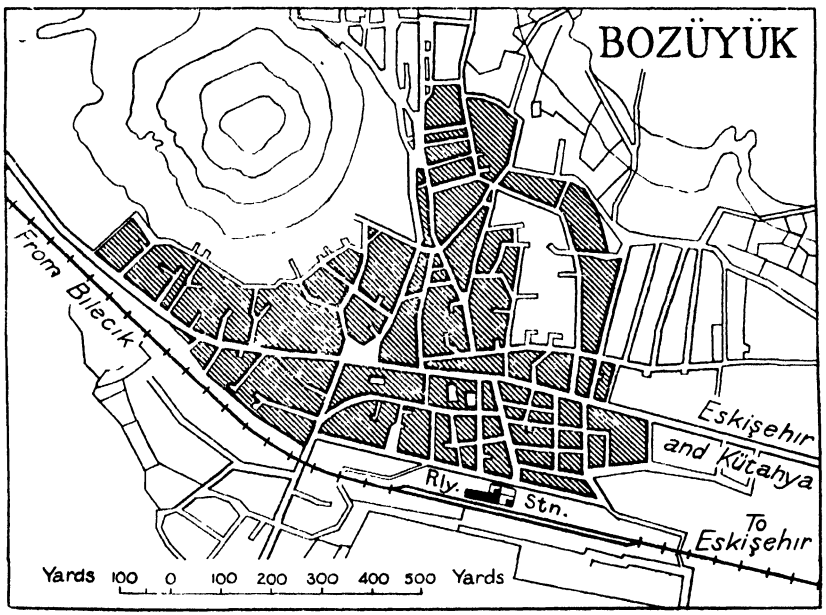


FIG. 124. *Plan of Bozüyük*

tributaries of the Nilüfer R. dissect the foot of the ridge into four spurs. On the most easterly are the mosques of Emir Sultan and Yilderim (founded by Bayazid I, 'the Thunderbolt', 1389–1402) and the military school. The second, formerly the Armenian quarter, is crowned by the Yeşil Cami of Mohammed I (1413–21), called 'the Green Mosque' from its glazed tiles, and the Yeşil Türbe, his tomb. On the third, W. of the Gök Dere bridges, are the early Ulu Cami, the municipal buildings, the large vaulted bazaar, and the Tekke Mevlevi of the 'Dancing Dervishes', and above them the precipitous flat-topped citadel (690 ft.)—the site of Bithynian 'Prusa' (185–75 B.C.)—with early Ottoman walls and towers, and the cold spring, Pinarbaşi, near the Calimboz ravine. On the westernmost spur, formerly the Greek quarter, are the mosque of Murad II (1421–51), and the tombs of the Sultans with gardens and great plane-trees. Brusa was the early

Ottoman country seat from 1327 to 1453, when Constantinople was taken by Mohammed II, 'the Conqueror', and during these years the city spread over the four spurs from E. to W. (photos. 120–22).

In the plain to the N. are the more modern parts of the city, and the Muradiye railway station (formerly 'Bursa Halt'), with the terminus 1½ miles farther E., near the Gemlik road.

About 1½ miles W. of the city, beyond the Ülfer (Nilüfer) Çay, is Çekirge village (*class.* Pythia) on another spur, with the Gazi Hunkiyer Cami of Murad I (1359–89), the Kaplica hot springs, the Büyük Kürkürtlu baths, and hotels for those who frequent them; lower down the Yeni Kaplica and Kara Mustafa baths: all served by Çekirge railway station, formerly known as Acemler.

Resources and Trade. Enclosed between the Marmara shore and high mountains southward, Bursa lies off the main routes of modern trade. But its lowland is very rich and on the water-laden foothills mulberries flourish without irrigation, maintaining a silk industry which is still important. The cocoons are brought from the villages to numerous spinning-mills. A small artificial-silk industry is also growing up, and there are numerous other industries, such as fruit-canning, meat-preserving, olive-oil and wine presses, carpet-weaving, all based on local agriculture.

Climate, Water, and Drainage. The climate is good but moist, and in summer sultry; the plain was formerly extremely malarious, but this is being rectified. Earthquakes are frequent. Water is copious, and well distributed in fountains throughout the city. There are hot medicinal springs, and mineral waters. Drainage schemes are being undertaken in the plain.

History. Prusa, founded about 185 B.C. at the suggestion of Hannibal in exile, was a principal city of the kingdom of Bithynia till 75 B.C. and later an administrative centre of the Roman province of the same name, chiefly famous as the birthplace of the Stoic preacher, Dio 'of the Golden Tongue', friend of the Emperors Nerva and Trajan. It was prosperous till it was destroyed before A.D. 1000 by Saif-ed-Daula of Aleppo. The Ottoman Turks made it their capital from 1327 till Adrianople superseded it in 1367. Always a strong point, it was attacked by Tatars in 1402, by Karamanians in 1413, by later rebels, and by Ibrahim Pasha of Egypt in 1833.

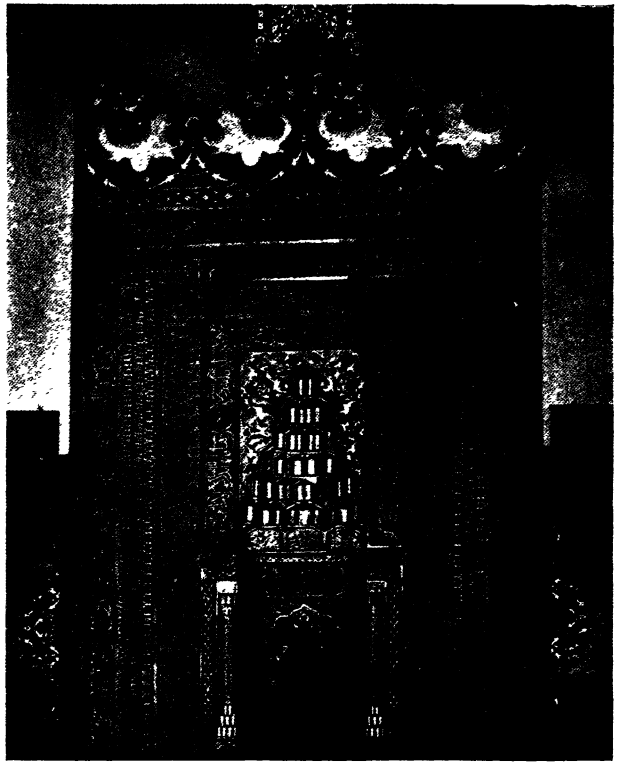
Communications. A narrow-gauge (1·05 m.) railway (route 13) connects Bursa with its port of Mudanya; it is proposed to convert this to normal gauge and to extend it to Bozüyük on the Haydarpaşa–Eskişehir line (route 2). Motor-bus and motor-lorry services ply through Gemlik to Yalova on the Gulf of Izmit, and a rough road continues round the shore of the gulf to Izmit. A good motor-road E. of the railway links Bursa with Mudanya; a rough motor-road goes W. along the plain to Bandirma and Balikesir, and a better road E. through Inegöl and Bozüyük for the plateau at Eskişehir and Kütahya, with a loop through Yenişehir and Bilecik to Karaköy. A dry-weather road S. from Bursa to Orhaneli is planned as a first-class link with the Kütahya–Balikesir railway at Tavşanli.



120. *General view of Bursa*



121. *View through the Gate of the Green Türbe, Bursa*



122. *In the Green Türbe at Bursa*

From Bursa the ascent of Keşiş Dağ, the Mysian Olympus, *c.* 8,180 feet, may be made in one day (6 hrs. climb, 4 hrs. descent); the best season is from mid-May to mid-October: a guide is necessary, and horses are usually taken to a point one hour from the summit. The view includes Istanbul, the Gulf of Izmit, and the lower Sakarya valley, the Kaz Dağ (Mount Ida), and the Dardanelles. In recent years there have been winter sports on the mountain slopes.

ÇANKIRI (Changra; *class.* Gangra Germanicopolis). 40° 37′ N., 33° 39′ E.; alt. 2,372 ft. (rly. stn.). Vil. cap. Pop. 9,750 (1935). Bank (Agricultural). Hospital (small). Electricity station (small).

The town is at the junction of the Tatli Çay and Çankiri Çay (Aci Su), tributaries of the Kizil Irmak, below a ruined castle. The Mescit Taş building is of the Seljuk period; the old town of Gangra, which stood on a hill, was almost entirely destroyed by an earthquake in 1050.

Hot summers encourage horticulture; local irrigation is practised, but rock-salt is mined in the plateau 2½ hours distant, and the Aci Su and soil near it are salt. Çankiri apples are notable.

Communications. Çankiri is on the Irmak–Filyos railway (route 11), before this begins the ascent to the Batibeli tunnel. It is also on the main road from Ankara through Kalecik to Kastamonu, from which several small Black Sea ports can be reached.

ÇAPAKÇUR (Bingöl, Çevlik). 38° 53′ N., 40° 30′ E.; alt. *c.* 4,000 ft. Bingöl vil. cap. Pop. 950 (1935).

Though selected to be the chief town of the newly created Bingöl vilâyet, Çapakçur can hardly yet be called a town. It is at the NW. end of its small plain, 13 miles long by 6 miles wide, on the right bank of the Sağyer stream, a right-bank tributary of the Murat. There are at present only rough roads NE. to Erzurum, W. to Palu, SE. to Genç, and E. to Muş; but development is contemplated and the new railway from Elâziz to Muş and Lake Van (route 27) is to pass through Çapakçur.

ÇARŞAMBA (Charshembe, Charshambah; *class.* Themiscyra). 41° 10′ N., 36° 42′ E.; alt. *c.* 200 ft. Samsun vil.: kaza. Pop. 7,050 (1935). Electricity station (small).

On the W. bank of the Yeşil Irmak, near the head of the delta, below the Pontic foothills. It takes its name (Wednesday) from the local market-day. The fertile delta plain produces cereals and tobacco. A narrow-gauge (750 mm.) railway (route 12*a*) joins the town to Samsun. The new Black Sea coastal motor-road also passes through it, crossing the river by the 12-span bridge (No. 29) which was completed in 1931. There is no road up the Yeşil Irmak gorge.

ÇATALCA (Chatalja). 41° 08′ N., 28° 28′ E.; alt. 50 ft. (rly. stn.). Istanbul vil.: kaza. Pop. 4,850 (1935).

About 6 miles from the head of the Büyük Çekmece estuary, and on the Istanbul–Edirne railway (route 1). Hills to E. are crowned with old fortifications—'the Chatalja Lines'—defined as the boundary of Turkey in the abortive 'Treaty of Sèvres' (I, p. 317) and forming an inner line of defence to the western approaches to Istanbul. Çatalca is linked by motor-

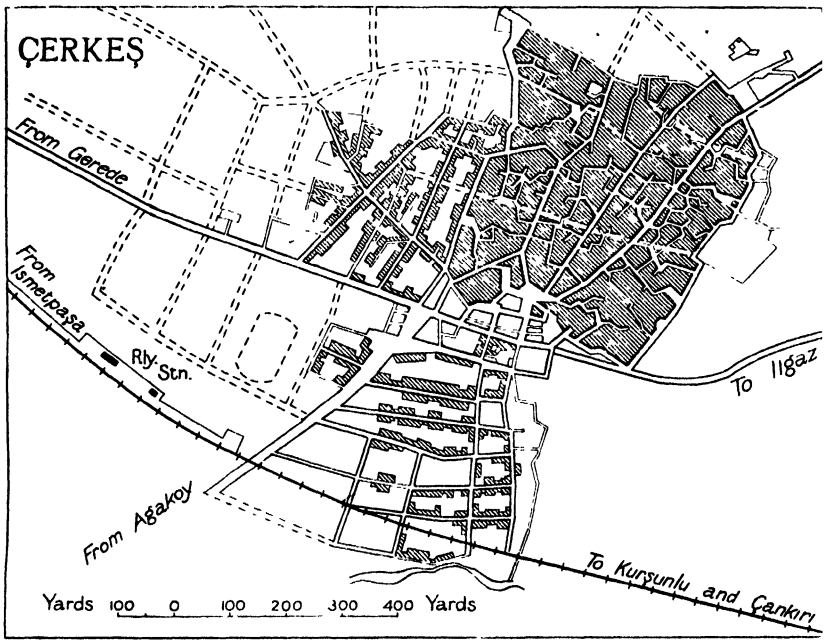


FIG. 125. *Plan and proposed expansion of Çerkeş*

road with the Istanbul–Edirne road at Büyük Çekmece, and by cart-roads with Silivri on the Marmara coast, Istanbul, and Kara Burun on the Black Sea coast.

ÇERKEŞ (Cherkesh, Cherkes). 40° 51′ N., 32° 54′ E.; alt. 3,671 ft. (rly. stn.). Çankiri vil.: kaza. Pop. 3,150 (1935).

A growing town on the uppermost headstream of the Ulu (Yenice) river, in a sunken *ova* between Gerede and Ilgaz, and on gentle lower slopes of a spur at the western end of the Ilgaz Dağ. Plans have been drawn up to widen and straighten the roads of the old town and to expand the residential district W. and S. (fig. 125).

Communications. On the Ankara–Zonguldak railway (route 11), about

half-way between the two; and on the new northern road from Izmit through Bolu to Ilgaz and Merzifon. There is a project to connect S. to Ankara by motor-road through Çubuk.

CEYHAN (Jehan). 37° 02′ N., 35° 47′ E.; alt. 98 ft. (rly. stn.). Seyhan vil.: kaza. Pop. 10,200 (1935). Banks (Agricultural, Ottoman). Hotels (4). Hospital.

The town is on the left bank of the Ceyhan R., here about 100–150 yards wide, in the rich plain of Çukur Ova, where cereals and cotton are grown. The population is increasing, new roads have been made and several of the old streets have been widened and straightened. Further improvements and extensions to E. and S. were planned in 1939 (fig. 126), with airfield to NE. Communication with the right bank used to be by ferry, but low water caused delay, and in 1937 it was decided to build a bridge. In 1941 the piers and superstructure had been completed.

Communications. The railway between Adana and Fevzipaşa (route 9) passes immediately S. of the town. The old road to Adana has been improved, but eastwards to Osmaniye it has fallen into disrepair and requires complete reconstruction. Cart-roads link Ceyhan with Karataş, Ayaş, and Dörtyol on the Gulf of Iskenderon. Airfield.

CIZRE (Jeziret ibn Omar; near *class.* Bezabde, *arab*: Beit Zabde). 37° 19′ N., 42° 09′ E.; alt. *c.* 1,300 ft. Mardin vil.: kaza. Pop. 5,500 (1935).

The town, with about 1,600 houses, is on a gravelly island of the Tigris about 90 miles above Mosul. The population was about 9,600 in 1895. The 'island' which gives its name to the town is only surrounded by water in flood-time. The normally dry W. channel—originally artificial—contains springs and is crossed by a wooden bridge (150 yds.) on stone piers: the E. channel (150 yds.), where the current is 2½ miles an hour in the low-water season (October), has a boat bridge. In flood-time (March–April) this bridge is replaced by ferry. The remains of an ancient bridge are 2 miles downstream (Pir-i-Bahfit).

The island is 700 yards long by 500 yards broad. The town is crowded, dirty, and unhealthy, within a Roman masonry wall, on which are the Government offices. There are mosques and some tombs of Abbasid princes. Alexander is believed to have crossed the Tigris here before his victory over Darius at Arbela in 331 B.C. The ruins of Bezabde are in the neighbourhood.

Miran and other Kurds pasture their flocks in the country to W. during winter and spring. In June they cross the river to summer pastures in the mountains to the E., returning in September. In the past there has been much Kurdish raiding, and Kurdish chiefs long levied customary tolls.

Supplies for travellers and caravans are fairly plentiful, with fruit in autumn from gardens down-river. Kurds come in from the hills to buy in

the market. Well-water is polluted; river-water should be filtered or chlorinated.

Communications. Caravans, and in dry weather cars, cross the river here on the journey between Diyarbekir and Mosul, but there is no metalled road. *Kelek*-rafts ply down stream from Diyarbekir, but less frequently, though in greater safety, than formerly. A new railway, now being extended from Diyarbekir through Batman and Garzan, has been projected through Cizre to Mosul (route 26).

ÇÖLEMERIK (Julamerk, Hakâri). 37° 36′ N., 43° 40′ E.; alt. *c.* 5,400 ft. Hakâri vil. cap. Pop. 1,550 (1935).

The village is about 2 miles up a side valley of the Greater Zab (Büyük Zap Su), in mountainous country, and below an old castle on a prominent crag. It was formerly dominated by semi-independent Kurdish Beys, the last of whom, Shaikh Ullah, was exiled in 1884. The Çölemerik valley rapidly steepens below the village and its stream enters the Zab gorge through a defile. The village is almost inaccessible except from the NW. where there are broad easy slopes with streams irrigating the fields. In recent years Çölemerik has been chosen as the administrative centre of the Hakâri vilâyet, and the formerly turbulent country to the SE.; a new road has been built to it from the town of Van.

ÇORLU (Chorlu; *class.* Tzirallum, Tzurullum). 41° 10′ N., 27° 47′ E.; alt. 377 ft. (rly. stn.). Tekirdağ vil.: kaza. Pop. 11,800 (1935). Bank (Agricultural). Hotels (2). Electricity station (medium).

On the watershed between the Marmara coast and the Çorlu Dere (1½ miles NW.), headwater of the Ergene, about 11 miles inland, in open undulating country. It has many vineyards and orchards. The beautiful Suleimaniye mosque was built by the famous architect Sinan. Supplies and dairy produce are plentiful.

The station on the Istanbul–Edirne railway (route 1) is 1½ miles NW. of the town. Here the trunk motor-road (Istanbul–Edirne) which passes through Çorlu crosses the railway. Cart-roads, motorable in fine weather, link Çorlu with Tekirdağ on the Marmara coast, and through Saray with Midye on the Black Sea coast.

ÇORUM (Chorum; near *class.* Euchaita). 40° 30′ N., 34° 57′ E.; alt. 2,300 ft. Vil. cap. Pop. 20,150 (1935). Bank (Agricultural). Meteorological station. Electricity station (medium).

The town lies in the upper half of its wide plain, about 2 miles from the western hill-slopes enclosing the *ova*. The lower plain is larger and more fertile, and formerly produced olives. The Çorum stream which waters these plains is a tributary of the Çekerek R. In a weak position SE. of the

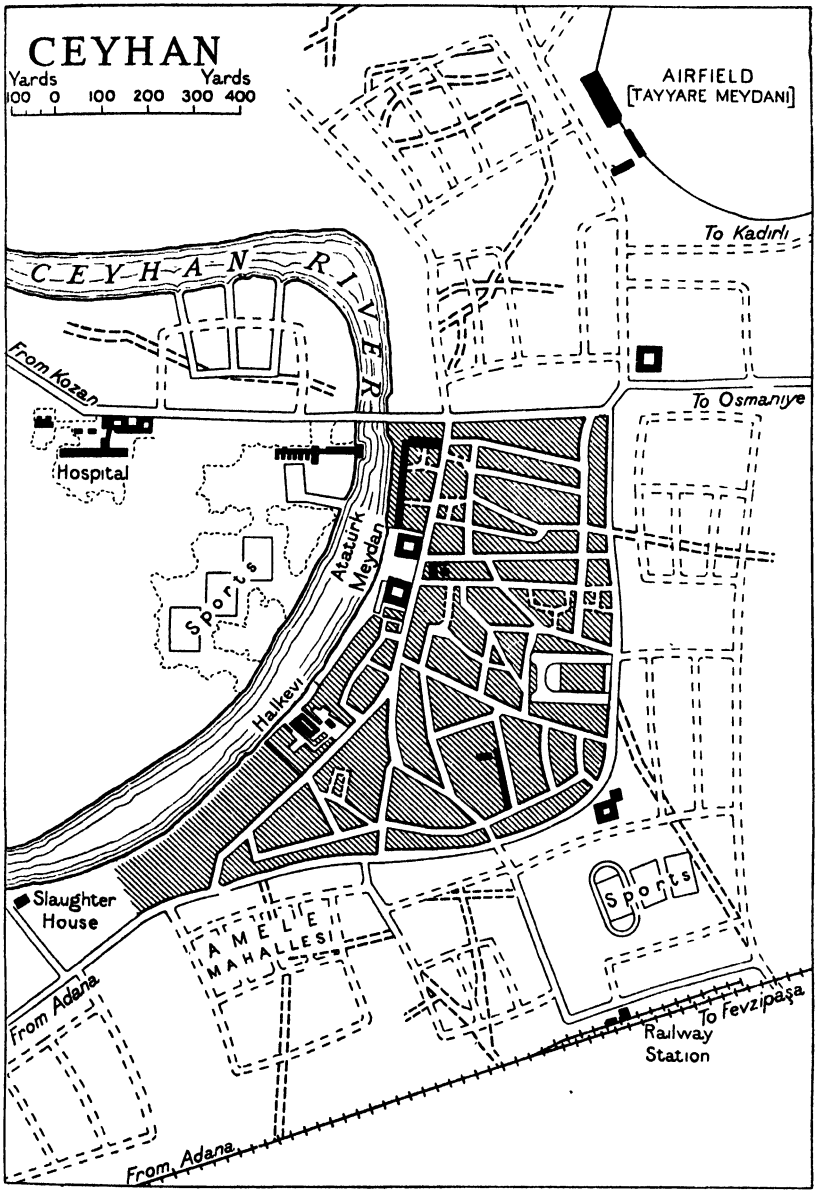


FIG. 126. *Plan of Ceyhan, showing proposed expansion*

town, on slightly rising ground, is a large Turkish castle. The principal mosque was built by Murad II (1421–51). The town is scattered and unattractive, but has good bazaars and many gardens among the houses.

The principal products of the plain are wool, skins, eggs, honey, and opium; there is a flour-mill in the town.

Euchaita was the traditional burial-place of S. Theodora. In Ottoman times the inhabitants were fanatical Moslems. The town owes its limited importance to its position on the ancient route from Kayseri through Yozgat to Samsun. Motor-roads now follow this route, with branches E. to Sivas, SW. to Kirşehir, and through Sungurlu to Çerikli on the Ankara–Kayseri railway (route 4).

DENIZLI (Denizlu). 37° 46′ N., 29° 05′ E.; alt. *c.* 1,360 ft. Vil. cap. Pop. 17,350 (1935). Bank (Agricultural). Bourse. Hotels (3). Meteorological station. Electricity station (small).

The town is on the S. side of the upper basin of the Büyük Menderes (here the Emir or Çürük Su; *class.* Lycus), above a fertile plain. Copious springs and many streams led the Turks to name it Denizlu. The old walled town (Laodicea ad Lycum) was founded by Antiochus II in honour of his wife, Laodice, on the site of Diospolis. It was famous for its sheep, and became the centre of the wool industry and a prosperous commercial town under the Romans. It early became one of the 'Seven Churches' (*Revelation* iii. 14), and the see of a bishop. The ravages of invading Turks and Mongols, as well as earthquakes, caused its decay, and the new town was built on higher ground about 3 miles south of the ruins, now known as Eskihisar. The new settlement also suffers from earthquakes (1933). Roads have been recently widened and straightened, and other improvements carried out.

Produce includes cereals, olives, opium, tobacco, cotton, grapes, almonds; linen is woven, and there are private cotton-mills. There was formerly a tanning industry; hides and wool are now exported.

Communications. Denizli is on a short branch of the Aydin–Afyonkarahisar railway (route 17), and on the new main road from Alaşehir in the Gediz valley which is being completed to Antalya. A road to Muğla is already completed as far as 15 miles S. of Tavas.

DEVELI (Everek). 38° 24′ N., 35° 30′ E.; alt. 3,940 ft. Kayseri vil.: kaza. Pop. 10,100 (1935). Electricity station (small).

On a stream in an eastern embayment of the Sultan plain, between Erciyas Dağ on N. and Develi Dağ on S. The extensive Sultansazliği salt-marshes and lake are about 10 miles SW.

Communications. Motor-road N. to Kayseri, and W. to Niğde–Kayseri motor-road and Başköy station on railway (route 10), except for first 10 miles, which is only partly built. Track SE. to Saimbeyli.

DINAR (Dineir, Geyiklar; *class.* Celaenae, Apamea Cibotus). 38° 03′ N., 30° 09′ E.; alt. 2,845 ft. (rly. stn.). Afyonkarahisar vil.: kaza. Pop. 4,200 (1935). Bank (Agricultural). Hotels (4). Hydro-electric station (small).

At the mouth of a glen, with a fine stream, overlooking the sources of the Büyük Menderes river. The ancient city, Celaenae, on a neighbouring hill with lofty precipitous citadel, was refounded on its present site by Antiochus I and became important in Hellenic times, but its trade diminished after the founding of Constantinople. It is still a prosperous market-town surrounded by gardens, and with water-driven flour-mills.

Communications. On railway from Izmir through Aydin to Afyonkarahisar and to Eğridir (routes 17, 18). Motor-roads to Afyonkarahisar, to Antalya by Burdur, and to Isparta and Eğridir.

DIVRIK (Divriği, Difrike; *class.* Tephrike, Aphrike). 39° 23′ N., 38° 08′ E.; alt. 3,202 ft. (rly. stn.). Sivas vil.: kaza. Pop. 5,900 (1935).

On the Çalti Su, above the gorge, near the site of Abrik castle, the ninth-century stronghold of the Paulicians, a heretical sect of Manichaean Christians, who successfully defied the armies of orthodox Constantinople for some years. Now a large and important iron-mining centre (p. 115), on the railway (route 7) between Sivas and Erzurum; motor-road N. to Zara in the upper Kizil Irmak valley; winding hill road SE. to Arapkir on the Elâziz–Iliç–Erzurum road. There is no road down the Çalti gorge, the route taken by the railway.

DIYARBEKIR (Diarbekr; *class.* Amida). 37° 55′ N., 40° 15′ E.; alt. 2,126 ft. (rly. stn.). Vil. cap. Pop. 43,250 (1940). Banks (Agricultural, Business, Ottoman). Bourse. Former British and French vice-consulates. Hospital. Meteorological station. Hydro-electric station (medium).

The town is strongly built within an easterly bend of the Tigris, on a line of steep basalt bluffs, bounding the W. side of the valley, which is here about one mile wide, before the river turns E. 5 miles to the S. The town has a great Roman wall, 30 to 50 feet high, 10 to 15 feet thick, of black basalt, the N. and E. parts being ruined where stones have been removed for buildings elsewhere. The wall has 82 towers—mostly circular, a few octagonal—and 4 gates: Dicle Kapisi or Yeni Kapi (E.), Dağ Kapi or Harput Kapi (N.), Urfa Kapi or Rum Kapi (W.), and Mardin Kapi (S.), the last leading to the Tigris bridge (photo. 114; I, fig. 38, p. 172); a moat is cut in solid rock on the S. The citadel in the NE. angle, much contested between Byzantium and Persia, and defended against the town by an interior wall, contains the old monastery and mosque, and the public offices, magazine, and smaller barracks: the main barracks are a mile beyond the Harput Kapi.

The houses are low and crowded, of stone and mud with flat roofs. There are some open spaces, and many mosques and *hans*; the Ulu Cami

1. Citadel. Old Monastery.
2. Citadel. Süle Kale.
3. Citadel. Mosque.
4. Peygamber Camisi.
5. Iskenderpaşa Camisi.
6. Hasanpaşa Hani.
7. Ulu Cami and Mesudiye Medresesi
8. Safa Camisi.
9. Melekahmetpaşa Camisi.
10. Sarisaltik mescidi harabesi.
11. Lalebey Camisi.
12. Sinmescidi harabesi.
13. Nasuhpaşa Camisi.
14. Fatihpaşa Camisi.
15. Kasimpadişah Camisi.
16. Behrampaşa Camisi.
17. Alipaşa Camisi.
18. Hüsrevpaşa hani.
19. Hüsrevpaşa Camisi.

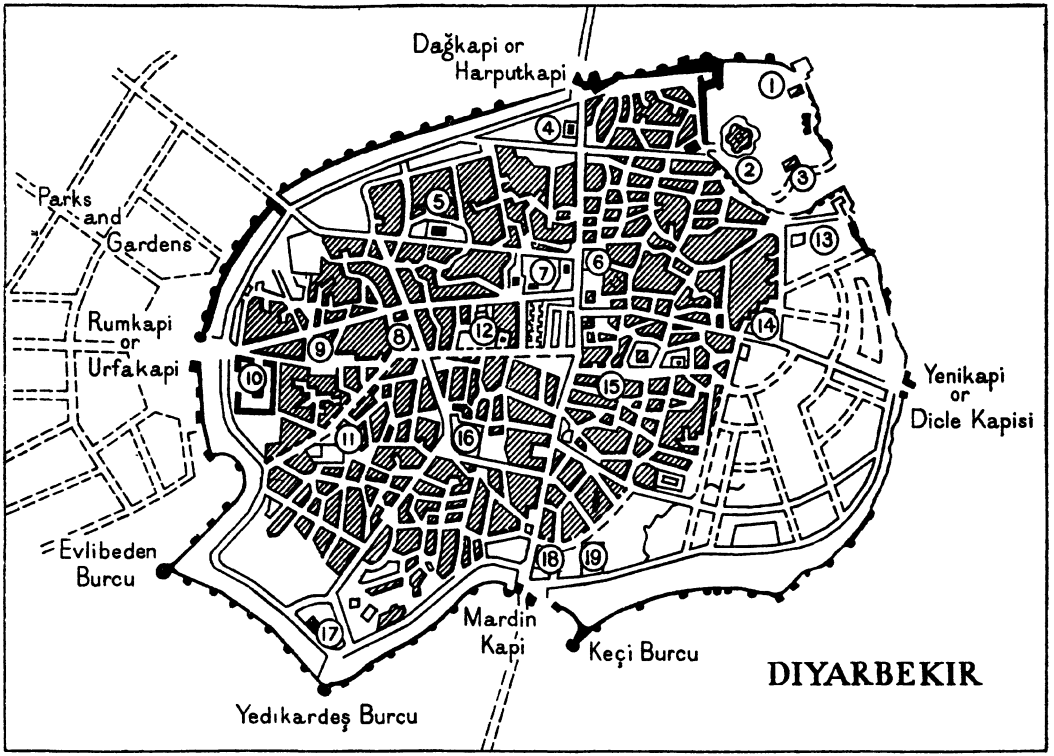


FIG. 127. *Plan of Diyarbekir (scale not known)*

with 200 columns, in the centre of the town, was a tenth-century church, built over the ruins of a classical temple. Two main thoroughfares intersect at right angles; the town has been much improved, some roads have been widened, bazaars are spacious and good (fig. 127; photo. 123); and the administration progressive, with modern schools and a model farm. The town is being extended outside the walls between the Rum Kapi and the railway. Here the People's House has been built and parks have been laid out.

To the E., cultivated slopes rise to 150–200 feet commanding the plain; two hills of similar height rise above the plain 5 miles W. of the town.

Resources and Trade. The district is fertile, but ill cultivated; it provides grain, vegetables, and fruit. Wheat is stored and exported in good seasons; sheep and goats are numerous. Exports include sheep, wool, mohair, furs, hides, butter; some copper from local mines, silk, cotton (from the Tur Abdin plateau to S.), rice. Cotton-weaving for local use was formerly prosperous; other industries are carpet-weaving, embroidery, leather-work, pottery, and characteristic gold and silver work.

Water is plentiful: the Kale Su, Belikli, and Göl Cami springs are outside the town; water from the Ali Pinar spring, 1½ miles to W., comes by aqueduct to the Ulu Cami, that from a remoter spring enters the NW. corner of the town. There are many public and private fountains, brackish wells in the houses, and a tank with sacred fish.

The *climate* is hot (July m.d. max. 99° F.), with occasional dust-storms. Winter is short but severe (Jan. m.d. min. 26° F.), with frost, snow, and fog. Annual rainfall 18 inches, most in Nov.–Dec. and in March–April.

History. Amida was long an important frontier fortress of the Roman Empire against Persia. It was founded in A.D. 341, and its defences were perfected by Constantius. It was first assaulted and taken after breach by battering-rams by the Sassanid King, Sapor II, who massacred the garrison and inhabitants. An even more notable siege occurred in 502, when Kobad finally assaulted the fortress after three months, again slaughtering the inhabitants. The Saracens took the city in 638, and it was held by the Ottoman Turks from the sixteenth century onwards. In 1895 it was one of the centres of the Armenian massacres, prompted by the Ottoman Government, but carried out by local Kurds. Known as 'Black Amida' in the past, a Turkish proverb describes it—'The walls are black, the dogs are black, but the hearts of the people are blackest of all.'

Communications. Diyarbekir is the centre of ancient routes from Syria and Asia Minor to N. Persia and Mesopotamia, and from the S. to Armenia. Some trade still passes by them; but the railway from Fevzipaşa (route 22) and that from Sivas to Malatya (route 23) compete for transit traffic, a position that will be more pronounced when the extension from Diyarbekir is completed to Iraq (route 26). There are good motor-roads NW. to Elàziz and Malatya, E. to Siirt and Bitlis; and fair roads W. to Urfa and S. to Mardin. Airfield.

DÜZCE (Dusje). 40° 50′ N., 31° 10′ E.; alt. *c.* 360 ft. Bolu vil.: kaza. Pop. 6,500 (1935). Electricity station (small).

A market town towards the east of a fertile depression (*ova*), on a small tributary of the Melen Dere, which drains into the Melen lake, and then breaks north through the coastal block. Mountains, richly wooded with oriental beech, fir, pine, and oak, rise steeply from the plain to N. and E. and give the town a local timber trade, additional to the agriculture of the plain.

Communications. Düzce is a growing town on the new main motor-road from Istanbul through Bolu to Ankara, and is also connected by motor-road with its port of Akçaşehir (Akçakoca) on the Black Sea. The projected northern railway from Izmit to Erzurum will also pass through.

EDIRNE (Adrianople; *class.* Hadrianopolis; *slav.* Odrin). 41° 40′ N., 26° 34′ E.; alt. 138 ft. (Karaağaç rly. stn.); 213 ft. (met. stn.). Vil. cap. Pop. 45,150 (1940). Banks (Agricultural, Business, Ottoman). Bourse. Hotels (3). Hospital. Barracks. Meteorological station. Electricity station (medium).

The old town stands on the left banks of the Meriç (Maritsa) and of the Tunca at their confluence, surrounded by a semicircle of low hills, crowned by a ring of forts, but open towards the S. across the broad Meriç valley where, at the mouth of the Arda tributary, is the suburb of Karaağaç. The low ground around the town is liable to flood in the spring; the neighbouring foothills to N. and E. are planted with vineyards (fig. 128; photo. 124).

There are four suburbs: Yildirim on the right bank of the Tunca, Kireçhane on the left bank of the Meriç below the old town, Kircik on a hill overlooking the city, and Karaağaç on the right bank of the Meriç, connected by old stone bridges.

Formerly prosperous and a great military centre, Edirne remains one of the chief cities of the Turks, its older quarters very little changed, with narrow streets and two-storied houses of wood and sun-dried brick; but there are some good modern buildings. Among the older are the mosques of Bayazid I (1389–1402), Mohammed I (1413–21), Selim II (1566–74), and Murad IV (1623–40), the Uç Şerifli Cami, and the Ali Paşa Bazar, one of the finest in Turkey. One of the Tunca bridges is Byzantine.

Winters are damp and cold, with frost and fog; summers dry and hot. Water is brought to a reservoir by aqueduct from the N. and is also obtained from the river, rain-water cisterns, and stagnant wells.

Trade. Edirne was formerly the commercial centre of Thrace; it is still important for its trade in tobacco and silk. Lesser industries deal with woollen, linen, and cotton goods, leather and tapestry, cereals, grapes, and other fruit, wine, and the famous Edirne cheese.

History. The town was founded about A.D. 125 by the Emperor Hadrian, on the site of ancient Uscudama, the chief town of the Bessi. It was the

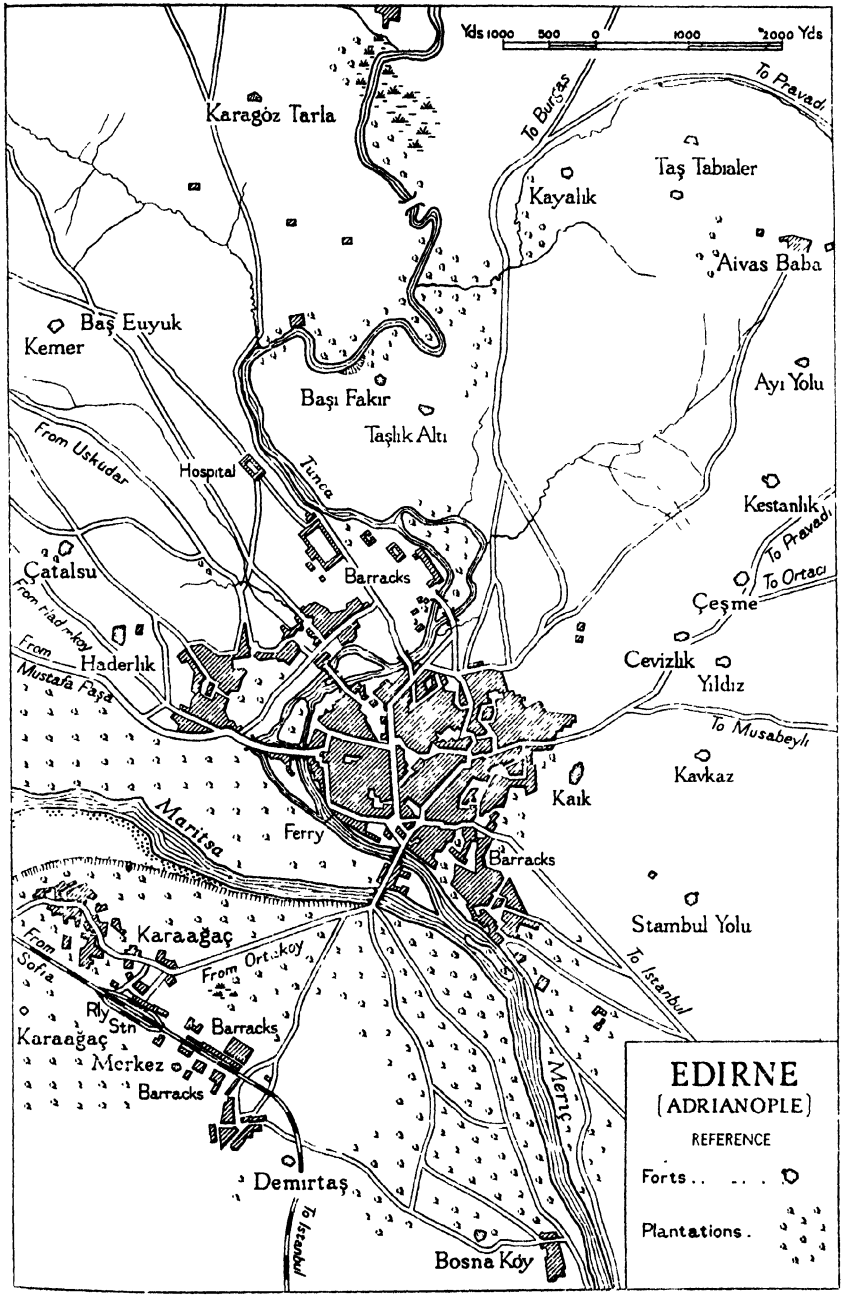


FIG. 128. *Plan of Edirne and neighbourhood*

most important of the many towns founded by Hadrian. After capture by Murad I it became the first European capital of the Ottoman Sultans from 1361 until 1453, when Constantinople fell to Mohammed II. It was occupied by Russians in 1829 and 1878, but returned to Turkey; lost in the first Balkan War 1912, restored after the second, 1913; lost during the War of Independence to the Greeks in July 1919, and regained by the Treaty of Lausanne in July 1923. It has occasionally suffered from earthquake and fire, the Kale quarter being rebuilt after the last conflagration in 1905.

Communications. Karaağaç station, in the suburb on the right bank of the Meriç, is on the railway from Istanbul to Sofia and Vienna (route 1), with branch in Greek territory to Dedeağaç (Alexandroupolis). Main trunk road to Istanbul and motor-road N. to Lalapaşa; E. to Kirklareli; S. to Dedeağaç (in Greece). Head of navigation on Meriç for flat-bottomed boats in winter and spring. Air landing-ground.

EDREMIT (Edremid; *class.* Adramyttium). 39° 35′ N., 27° 02′ E.; alt. *c.* 150 ft. Balikesir vil.: kaza. Pop. 12,550 (1935). Electricity station (medium).

The town lies between spurs of the Kaz Dağ which shelters it from the N., on the N. margin of its coastal plain, and on the right bank of its river, about 5½ miles E. of its small port of Ilica (Akçay). Most of the houses are of wood, surrounded by olive-groves and vineyards. The neighbouring hills are wooded, and timber is cut at a steam saw-mill. Olives are the chief crop; oil of good quality is produced from them. Wine, honey, wax, raisins, figs, valonia, sesame, tobacco, and soap are other products. Water is plentiful and good, and the town is healthy.

The ancient port was founded in the early sixth century B.C. by Adramytus, son of Alyattes of Lydia, and later colonized by Athenians; it was well known under the kings of Pergamum and an assize town in Roman times. S. Paul sailed from Caesarea in one of its ships (*Acts* xxvii. 2). The head of the gulf is now silted and marshy.

Communications. The narrow-gauge mineral line between Ilica and Palamut passes through Edremit, but has been almost superseded by the motor-road which runs alongside it and continues E. to Balikesir. Two miles E. of Edremit the main coast road leaves for Burhaniye, Ayvalik, and Izmir.

EĞRIDIR (Egirdir; *class.* Prostanna). 37° 50′ N., 30° 50′ E.; alt. 3,107 ft. (rly. stn.). Isparta vil.: kaza. Pop. 5,750 (1935). Electricity station (small).

The town is at the foot of the Camili Dağ, and occupies a small rocky promontory at the S. end of Eğridir Göl; on the point are the old mosque, *konak* and *han.* Houses are close to the water's edge and rise in tiers behind. The nearer island off the point has vineyards and gardens; Nisadasi, a



123. *Diyarbekır. Inside the walls*



124. *Edirne (Adrianople)*



small islet farther N., has a Byzantine church and was formerly a Greek settlement. The Eğridir Göl (3,030 ft.) is divided by mountain spurs, and the S. part is entirely surrounded by steep slopes except where the Boğaz Su has cut a valley. The N. part, Hoyran Göl, has lower hills, and some flat shore and swamp. Fish are abundant and various, and good grapes are grown on the hill-sides. Occasionally the lake is frozen in winter.

History. The old town, later Prostanna, long forgotten but with Byzantine fortress restored by the Seljuk Sultan Ala-ed-Din, stands on the promontory, and there is a Byzantine church with frescoes. Ibn Batuta described it in the mid-fourteenth century as a great town, well built, with fine markets and well-watered gardens: the lake traversed by the boats of merchants who traded with others on the shores of lakes Akşehir and Beyşehir. It was captured by Tamerlane in 1402.

Communications. The town became the terminus of the British-built railway from Izmir through Aydin in 1912 (routes 17, 18) and is now in touch with Ankara, Burdur, and Isparta by new railways built from Karakuyu, Baladiz, and Bozanönü on the old line. A single line runs along the promontory to a wooden jetty where lake traffic is handled. A motor-road leads W. to Isparta, whence a dry-weather road continues to Baladiz for Dinar and Burdur; to the E. the motor-road is being continued round the S. and E. shores of the lake, through Hüyük and Örkenez to Akşehir on the Afyonkarahisar–Konya railway.

ELÂZIZ (Elâziğ, El Aziz, Mezreh). 38° 41′ N., 39° 14′ E.; alt. 3,346 ft. Vil. cap. Pop. 23,200 (1935). Bank (Agricultural). General and Leper Hospitals. Hotel. Meteorological station. Electricity station (medium).

Elâziz, or Elâziğ—both spellings are used officially—is in the hill country north of the Harinke valley, between Lake Gölcük (Hazar Gölü) and the Murat tributary of the Euphrates. It is newly built and has grown rapidly in the last few years as the chief administrative centre of a vilâyet whose resources and communications are being developed.

Its history is bound up with that of Harput, 3 miles to the N., whose place it has taken. Latin inscriptions in the neighbourhood recall a Roman expedition of the time of Nero (A.D. 65). In the great castle of Hisn Ziyad (Harput) were imprisoned the three Crusaders, Jocelyn of Courtney (Count of Edessa), Waleran, and Baldwin II of Jerusalem, captured by the Seljuk Emir Balak about 1122. In the thirteenth century it became the flourishing Armenian town of Khartabirt (Kharput) and after temporarily passing into Mongol hands in the fourteenth, again became predominantly Armenian. In the later Ottoman period the population was mixed, Armenians, Jacobite Syrians, and Kurds, and there was an American Mission College; it was then that the neighbouring Mezreh, or El Aziz, became the residence of the Turkish Vali, his officials, and a small garrison.

Communications. Elâzi zis on a branch line of the Fevzipaşa–Diyarbekir railway (route 22), and the starting-point of the line now being built

through Çapakçur to Muş, Van, and the Persian frontier (route 27). It has a network of cart-tracks and good motor-roads SE. to Diyarbekir, SW. to Malatya, NW. to the Euphrates crossing at Kebanmadeni, and N. to Hozat and Mazkirt.

EREĞLI (*class.* Cybistra-Heraclea). 37° 31′ N., 34° 02′ E.; alt. 3,491 ft. (rly. stn.). Konya vil.: kaza. Pop. 9,550 (1935). Hotels (2). Hydro-electric station (medium).

The town is on rising ground at the foot of the Toros Dağ, on the lower Suhayli Su, a little above its outfall into the E. end of Ak Göl. Marshes spread to N. and W., tending to make the town unhealthy, but the water supply is good, and orchards and gardens round the town are irrigated. Houses are mostly of sun-dried brick. There is a State cotton-mill.

History. The site may have been occupied in Hittite times, for at Abariz (Ivriz), on a spur of the Toros Dağ opposite Zanapa, 3 hours ride to the SE., is one of the finest Hittite rock sculptures. The town of Heraclea was an outpost to Konya against invaders from the S. through the 'Cilician Gates'. It was stormed by Harun-ar-Rashid in 805, but remained Byzantine thereafter until the eleventh century.

Communications. On the 'Baghdad railway' (route 9) between Konya and Ulukişla. The dry-weather road from Konya through Karaman to Ulukişla passes through it, and summer tracks take a more direct route to Konya and Niğde.

ERGANIMADENI (Maden, Arghana Maden). 38° 23′ N., 39° 41′ E.; alt. 3,146 ft. (rly. stn.). Elâziz vil.: kaza. Pop. 2,750 (1935).

The town is on the right bank of the upper Tigris, about 10 miles from its source. The copper-mines, responsible for the growth of the settlement, are about 300 feet above the river; equipment is modern, and there are new administrative buildings, club, and school (fig. 25, p. 120). The Güleman chrome-mines are about 12 miles E. and Ergani town about 16 miles S. by rail. Ergani town and Erganimadeni are often confused; the latter is, however, often known as 'Maden' (the mine), while the former is sometimes called Ergani-Osmaniye, though Osmaniye is actually a separate village.

Communications. On the Malatya–Diyarbekir railway (route 22) and Elâziz–Diyarbekir motor-road.

ERMENEK (Ermenâk; *class.* Germanicopolis). 36° 38′ N., 32° 56′ E.; alt. *c.* 4,100 ft. Konya vil.: kaza. Pop. 6,750 (1935). Hydro-electric station (small).

On wooded slopes of the Taurus above the southern branch of the Gök Su, where the valley is about 2 miles broad. Houses are scattered and on terraces. The town is being replanned (1941).

The fortress, founded by Antiochus IV in the first century A.D. and named after Gaius, Claudius, or Nero, who all bore the title of Germanicus, flanked the ancient route through the Taurus between Seleucia (Silifke) and Karaman. It later became a robber and pirate stronghold—the neighbouring limestone cliffs are honeycombed with their hide-outs—and was an important centre of the Karamanian emirates and during the decline of Seljuk power. To-day it can only be reached by rough hill-roads from Mut (E.), Silifke (SE.), and Anamur (S.).

ERZINCAN (Erzingan, Arzanjan; *class.* Aziris). 39° 44′ N., 39° 30′ E.; alt. 3,894 ft. (rly. stn.). Vil. cap. Pop. 16,150 (1935).

An important old military station, near the W. end of its plain (21 miles long by 8 broad), and on the northern Euphrates (Kara Su). Drainage and irrigation are being carried out to diminish marsh and to improve cultivation. The town was well built with large Government buildings, barracks, military hospital, but was reduced to ruins by earthquake in 1939. Over 7,000 buildings were wholly or partially destroyed and 10,000 people killed. Plans have been drawn up laying out a new town, but the state of reconstruction is not known. Before 1914 there was a large Armenian population.

Water is plentiful and there are several mineral springs. The climate is moderate, because sheltered, with no rigorous winter, a warm spring, but an oppressive summer with severe storms in July. Good orchards and gardens surround the town. Products are wheat, fruit (especially melons), butter, honey, and cotton. Textiles, clothing, leather goods, and copper work were the main industries.

The town was the scene of Byzantine defeats in 1071 by Seljuks and in 1243 by Mongols, but its walls were rebuilt by the end of the thirteenth century by the Seljuk Sultan Ala-ed-Din Kaikobad. Having been often visited by earthquakes (a particularly disastrous one occurred in 1784), it has no monuments of note.

Communications. On the Sivas–Erzurum railway (route 7). A dry-weather motor-road goes N. through Gümüşane to Trabzon on the Black Sea coast, and the great lateral road, at present being reconstructed as a motor-road, from Adapazari to Erzurum, passes through. A cart-road leads down the Euphrates valley to Iliç, for Elâziz and Malatya.

ERZURUM (Erzerum; *class.* Carana, Theodosiopolis). 39° 55′ N., 41° 17′ E.; alt. 6,096 ft. (rly. stn.). Vil. cap. Pop. 36,400 (1940). Banks (Agricultural Business). Meteorological station. Electricity station (small).

The important city of Erzurum stands in the uppermost valley of the northern Euphrates (Kara Su) on gently rising ground 5 miles S. of the river, overlooking a broad cultivated plain, 20 miles long from W. to NE. The Palandöken Dağ (*c.* 10,900 ft.) rises steeply to the S., the Oluklu spur of Kargapazari Dağ encloses the plain on the E., and between the two the

Deveboynu pass (800 feet above the plain), 5 miles E. of the town, leads to the Pasinler plain of the upper Aras (Araxes).

The city has threefold walls, with principal gate to S., and is further defended by earthworks and forts, particularly on the E. The citadel, partly demolished, is on a hill in the centre; many of the streets are narrow and rough, but the layout has been improved. There are many mosques, *hans*, and a fine Seljuk *medresseh* of the twelfth century with two tiled minarets. Houses are of grey volcanic stone and mud, with timbered courses to resist frequent earthquake shocks, and have flat roofs, often covered with turf. Spring-water is brought to fountains in the town.

The climate is extreme but bracing. Winter is bitterly cold, and both snow and frost may occur until June; the air is, however, dry and clear, and the sun shines. Summer is warm and sunny. Annual rainfall 18 inches, mostly in early summer.

Trade. The bazaars are well stocked with Persian rugs, furs, silks, and food; leather, iron, brass, and copper are worked; a State cotton-mill is planned.

History. Erzurum, guarding the road from Persia by the Araxes to the Euphrates and Asia Minor, has always been a great town. The citadel was founded by the Emperor Theodosius the Younger about A.D. 415 to keep the Armenians in subjection. Many fine churches were built, and a mosque on the model of the Kaaba at Mecca. The town became known to the Arabs as Arzan-ar-Rum, and to the Armenians as Karin. It was taken by the Russians in February 1916, but reoccupied by the Turks in 1918 after the Russian Revolution.

Communications. The railway from Sivas (route 7) was completed in 1939; a narrow-gauge line (750 mm.) leads E. by the Aras to Sarikamiş, where it meets the old Russian broad-gauge line to Leninakan (routes 24, 25). The chief line of communication, however, is the great trunk road, now first-class from the port of Trabzon, through Erzurum to the Persian frontier. A branch from this at Horasan goes NE. through Sarikamiş and Kars to Leninakan, and another road from Erzurum goes NE. through Oltu, Göle, Ardahan, and Zurzuna to Akhalkalaki in Russia on the Batum–Tiflis road. To the W., a road goes down the Euphrates valley through Erzincan and Iliç to Elâziz and Malatya. Airfield.

ESKIŞEHIR (Eski Shehr; *class.* Dorylaeum). 39° 46′ N., 30° 31′ E.; alt. 2,598 ft. (rly. stn.). Vil. cap. Pop. 60,600 (1940). Banks (Agricultural, Business, Ottoman). Bourse. Hospital. Malaria commission centre. Hotels (4). Agricultural Research and Meteorological stations. Air Training School. Electricity station (large).

The town stands on convergent slopes on the banks of the Porsuk Çay, at its confluence with the Sari Su. The ancient town surrounds an isolated hill to NE. The old Turkish and new residential quarters are on the higher

ground. East of the river a new quarter connects with the railway station. The Porsuk provides copious but muddy water, power for factories and flour-mills, and fish of poor quality. There are mineral-water springs.

Local products include cereals, sugar-beet, opium, wool, mohair, hides, and furs; meerschaum and some chrome are mined in the neighbourhood. There is cold-storage plant and a large silo (4,000 tons capacity); sugar-refinery; aeroplane assembly plant and glider factory.

History. Always important strategically—it was taken by the Seljuks in 1074, by the Crusaders in 1097, by the Turks of Konya in 1176, and by the Greeks in the Turkish War of Independence in 1921—Eskişehir has prospered through its good climate, fertility, local industry, and position at the north-western gate to the central plateau.

Communications. It is the rail junction for Haydarpaşa (route 2), Ankara (route 3), and Afyonkarahisar and the W. and S. (route 8). In peace-time there are civil air-routes to Europe, Ankara, and Izmir.

There are no good motor-roads, but a number of roads and tracks radiate from the town to link with the plateau, Black Sea coastlands, Marmara region, and western Anatolia. Two roads go NW. to Bilecik, one through Söğüt and the other up the Sari Su valley through Inönü and Bozüyük. A branch from Inönü goes S. to Kütahya and Afyonkarahisar. Another road follows the Porsuk valley and the railway E. to Sariköy, then turns N. to Beypazari for Ankara. Ankara is also reached by a road SE. through Sivrihisar, Polatli, and Haymana.

GAZIANTEP (Aintab). 37° 04′ N., 37° 23′ E.; alt. *c.* 2,750 ft. Vil. cap. Pop. 57,300 (1940). Banks (Agricultural, Business, Ottoman). Hotels (3). Hospital. Meteorological station. Electricity station (medium).

This growing town lies in open, rolling, and fertile country, with higher ground to the S., occupied by a ruined medieval castle and by the American Mission College and its hospital. It is well built with stone houses, often two-storied and with flat or low-pitched roofs. Streets are 15–25 feet wide and paved. Water, brought from the hills by an old aqueduct, supplies fountains throughout the town. Well-water is bad, but the American College has a deep well (120 ft.) worked by a wind-pump. Wood is scarce, but charcoal is brought in from the country (photo. 125).

Around the town are gardens, vineyards, and olive-groves. Chief products are cereals, grapes, pistachio-nuts, aniseed, opium, and tobacco.

There was formerly a large American community, and beside the former Mission College a Franciscan monastery.

Communications. Gaziantep is on no railway route, but is connected by motor-road SE. to Ağaçkoyunlu station on the Baghdad railway (route 21), SW. to Kilis for Antakya (Antioch) and Aleppo, W. to Fevzipaşa, and NW. to Maraş, the last road crossing the Fevzipaşa–Malatya railway (route 22) at Narli station. A motor-road is projected E. through Nizip to Birecik.

GEDIZ (Gedis; *class.* Cadi). 39° 02′ N., 29° 26′ E.; alt. *c.* 2,700 ft. Kütahya vil.: kaza. Pop. 5,550 (1935).

On the headwaters of the Gediz Çay (*class.* Hermus), in a deep hollow among precipitous volcanic hills drained through a narrow gorge. The streets are narrow and winding, the houses flat-roofed and of mud-brick. Originally a Macedonian colony, the only antiquities are some marble blocks and an inscription on the bridge NE. of the town.

Communications. On the motor-road between Kütahya and Uşak—both on railways (routes 16, 14)—with a branch motor-road to Simav. Rough tracks lead NW. to Emet and SE. to Banaz.

GEREDE (Geredeh; *class.* Crateia Flaviopolis). 40° 49′ N., 32° 11′ E.; alt. *c.* 4,000 ft. Bolu vil.: kaza. Pop. 4,250 (1935). Electricity station (small).

On the S. foothills of the Arkot Dağ overlooking the Ulu Ova which is drained by a tributary of the Yenice (Filyos) R. The plain is well cultivated, and the town increasing in prosperity because of its position on the new Istanbul–Ankara motor-road, near the junction with the motor-road to Ereğli and Zonguldak. Another motor-road goes E. to Ismetpaşa station (Bayindir) on the Ankara–Filyos line (route 11).

GEYVE (Geiveh; *class.* Tottaeum). 40° 30′ N., 30° 19′ E.; alt. 230 ft. (rly. stn.). Kocaeli vil.: kaza. Pop. 2,700 (1935). Electricity station (small). Meteorological station.

A small town near the right bank of the Sakarya, above the defile which leads to the Sapanca lowland. Mulberries and country produce are grown. The town is chiefly important as a road-rail junction. The old Ankara road through Beypazari and Göynük crosses the Sakarya by bridge 2 miles N., near the railway station, and follows the Eskişehir–Haydarpaşa railway (route 2) northwards through the gorge.

GÜMÜŞANE (Gumushkhane). 40° 28′ N., 39° 27′ E.; alt. *c.* 3,800 ft. Vil. cap. Pop. 3,150 (1935). Bank (Agricultural).

The upper town is one mile up a wild glen, S. of the Harşit Dere, through which passes the highway from Trabzon to Erzurum. The lower town is on this road, and the two parts are connected by a winding road (I, photo. 46, p. 110). The upper town has been almost uninhabited since the exchange of populations in 1921–3, and many of the buildings were in ruins in 1932. Both towns were badly damaged by the 1939 earthquake, over 800 houses being wholly or partly destroyed.

History. The ancient silver-mines of the Chalybes E. of the town were once productive. The ore was smelted with local wood-fuel and also yielded lead and some gold. The industry has long ceased and the inhabitants have turned to fruit-growing.

Communications. On the main trunk road from Trabzon to Erzurum and

Persia. A little-known track (p. 51) follows the Harşit from Torul to Tirebolu; there is also a road, believed fit for light cars, which branches from the Trabzon–Erzurum road 7 miles W. of Gümüşane and crosses the hills S. to Şiran for Şebinkarahisar and Sivas. Another branch 10 miles E. of Gümüşane goes S. to Erzincan.

HAVZA (Khavza; *class.* Thermae Phazemonitarum). 40° 59′ N., 35° 39′ E.; alt. 2,028 ft. (rly. stn.). Samsun vil.: kaza. Pop. 3,400 (1935). Electricity station (small).

On a tributary of the Yeşil Irmak, about 12 miles NE. of Merzifon. Hot sulphur springs, famous from antiquity, with ruins of ancient baths. Good bazaar and *hans*. On Samsun–Sivas railway (route 12). Motor-roads W. to Boyabat for Kastamonu and Sinop; NE. by the Kavak pass to Samsun; SE. to Erbaa, Niksar, and the Kelkit valley; S. to Amasya; and SW. through Merzifon to Çorum for Ankara and Yozgat.

HENDEK (Khandak). 40° 48′ N., 30° 45′ E.; alt. 590 ft. Kocaeli vil.: kaza. Pop. 4,950 (1935). Hydro-electric station (small).

On rising ground at the E. end of the Ak Ova. Tobacco and timber industries, especially beech. There are cold-storage facilities. On the main motor-road from Istanbul to Ankara, 18 miles from Adapazari, 17 miles from Düzce.

IĞDIR. 39° 56′ N., 44° 02′ E.; alt. *c.* 2,850 ft. Kars vil.: kaza. Pop. 6,750 (1935). Meteorological station.

On slightly rising ground in the marshy plain of the Aras R., here on its eastward course between the volcanoes of Alagöz and Ararat, 7 miles S. of the river and the Russian boundary. Ararat rises steeply to 16,946 feet on the south. The district is fertile but unhealthy, though this should be rectified when the projected drainage and irrigation schemes are finished. Cotton-growing is becoming the chief agricultural industry.

Communications. Formerly dependent on Erivan in Russian territory, with which it is still connected by road through Bağarşapat (Echmiadzin), Iğdir is now a Turkish frontier town of growing importance, connected by motor-road NW. through Tuzluca with Kağizman and Kars, and S. with Bayazit (Doğubayazidi).

ILGIN (*class.* Tyriaeum). 38° 16′ N., 31° 55′ E.; alt. 3,379 ft. (rly. stn.). Konya vil.: kaza. Pop. 3,400 (1935). Meteorological station.

On stream flowing N. from Sultan Dağ, 2 miles S. of L. Çavuşçu. The surroundings are fertile and the town well supplied with cereals, vegetables, and fruit. Hot springs to W.

Communications. On the old Anatolian railway between Afyonkarahisar and Konya (route 8), and on motor-road, bad in parts, between the same places.

INCESU (Injesu). 38° 37′ N., 35° 13′ E.; alt. 3,517 ft. (rly. stn.). Kayseri vil.: kaza. Pop. 3,850 (1935).

A small clean stone-built town on the Kayseri–Niğde–Ulukişla railway (route 10) at the entrance of a stony valley opening westwards to Ürgüp, Üçhisar, and Nevşehir (I, photos. 81–4, pp. 164–5). It is the station from which these places of tourist interest may be reached by road, over the Topuz Dağ pass.

INEGÖL (Inegeul). 40° 05′ N., 29° 31′ E.; alt. *c.* 1,000 ft. Bursa vil.: kaza. Pop. 13,100 (1935). Hotel. Electricity station (medium).

On rising ground in the middle of the marshy basin of the Gök Su. Neighbouring slopes are cultivated. On the Bursa–Eskişehir motor-road, with branches N. to Yenişehir for Iznik, and S. to Domaniç for Tavşanli.

ISKILIP (Iskelib; *class.* Andrapa, Neapolis, Neoclaudiopolis). 40° 44′ N., 34° 29′ E.; alt. 2,362 ft. Çorum vil.: kaza. Pop. 10,700 (1935).

The town, on the left bank of the Şehirmeydan tributary of the Kizil Irmak, lies at the foot of a limestone crag with an old fortress, among wooded hills. The Pontic Paphlagonian village of Andrapa was changed into the Roman town of Neapolis by Pompey (*c.* 60 B.C.), becoming later the semi-independent city-state of Neoclaudiopolis with coins of its own. It appears to have been of no great importance in medieval times, and is secluded. There are gardens and vineyards below the town, but the slopes above are bare. There is a motor-road SE. across the Kizil Irmak to Çorum, and a track SW. to Çankiri.

ISPARTA (Isbarta, Hamitabat; *class.* Baris). 37° 45′ N., 30° 34′ E.; alt. *c.* 3,400 ft. Vil. cap. Pop. 18,450 (1935). Banks (Agricultural, Business). Hotels (2). Prison. Meteorological station. Electricity station (medium).

The town lies between lakes Burdur and Eğridir on slightly rising ground at the S. end of the fertile Isparta plain, between two ranges of the western Taurus. It is well built, and surrounded by gardens, vineyards, and orchards of plums, pears, and walnuts. Good crops of wheat are grown. Streets are narrow. There are many mosques. The town suffered from earthquakes in 1889 and 1914.

Besides its agricultural trade in cereals and fruit, there are pottery and rug industries, cotton-mills, a State factory to make attar of roses, and a new china factory, opened in 1938.

Communications. Isparta is the terminus of a branch railway (8½ miles) from Bozanönü on the Eğridir line (route 18). Motor-roads NW. to Dinar, with branch SW. to Burdur; S. to Bucak for Antalya; NE. to Eğridir.

ISPIR (*Arm.* Simpatakitis). 40° 29′ N., 41° 00′ E.; alt. *c.* 3,750 ft. Erzurum vil.: kaza. Pop. 1,500 (1935).

A small town with ruined castle on a rugged spur commanding a bridge

over the Çoruh above its middle gorge (I, photo. 54, p. 115). Residential part at W. foot of spur with wooden houses, mostly flat-roofed. There is cultivation and fruit, especially mulberries, in the valley bottom; grazing for horses and cattle.

Communications. A dry-weather road possibly fit for light motors leads up the Çoruh to Bayburt. There are rough tracks over the mountains N. through Hemşin to Pazar on the Black Sea coast, and S. to the upper Euphrates at Erzurum and Aşkale.

IZNIK (Isnik; *class.* Nicaea). 40° 27′ N., 29° 44′ E.; alt. *c.* 275 ft. Bursa vil.: kaza. Pop. 2,500 (1935).

The town stands on the E. shore of Lake Iznik, which occupies a submerged valley but is cut off from the sea, and at the W. end of a broad valley with access to the lower Sakarya and the Ak Ova. Of no great importance to-day, it occupies the site of Byzantine Nicaea, the ruins of which, notably the double walls, with gates and towers (I, photo. 119, p. 268), are well preserved. The first general Ecclesiastical Council met here in A.D. 325, and formulated the Nicene Creed; there was a later Council in 787. The city was taken by the Crusaders in 1087, and by the Ottoman Turks under Orkhan (*c.* 1330).

The surrounding country is cultivated with cereals, vines, mulberries and other fruits, and vegetables.

Communications. A motor-road leads E. to Mekece on the Sakarya, and on the railway from Istanbul to Eskişehir (route 2); a branch cart-track from this leads to Osmaneli. Other tracks go round the lake and S. to Yenişehir, on the Bursa–Bilecik motor-road.

KARABÜK. 41° 12′ N., 32° 37′ E.; alt. 853 ft. (rly. stn.). Zonguldak vil. Hospital. Electricity station.

Karabük is an important industrial town near the confluence of the Soğanli Su (Yenice) and its tributary the Araç Cay, with thickly wooded hills to W. and N. Formerly a centre of timber trade, its site, on the new Ankara–Zonguldak railway and near the Black Sea and the Zonguldak coal-field, was chosen for Turkey's iron and steel works, before the iron deposits at Divrik were discovered (I, photo. 44, p. 108).

These modern works—built and partly operated by the British firm of H. A. Brassert & Co., though owned by the Sümer Bank—cover a large area and include blast and open-hearth furnaces, coking ovens, foundries, rolling-mills, gasworks, cement and slag brick-works. Large administrative offices, canteen, cinema, and other buildings are attached. There are still some saw-mills with State timber-yards. Chemical works and a synthetic oil-plant are projected.

Communications. On the Ankara–Zonguldak railway (route 11). Motor-roads NE. to Safranbolu for Bartin and Amasra on the Black Sea coast, and

for Kastamonu. Rough tracks S. to the Bolu–Çerkeş motor-road and W. to Devrek.

KARACABEY (Mihaliç, Muhalich; *class.* Miletopolis). 40° 13′ N., 28° 21′ E.; alt. *c.* 240 ft. Bursa vil.: kaza. Pop. 9,250 (1935). Bank (Agricultural). Meteorological station.

The town is in a strong position on a low broad ridge, sloping steeply to the Susurluk (Simav) Çay on the W., and to the Kirmasti (Atranos) Çay below its exit from Lake Apolyont. It is surrounded by vineyards, orchards, and mulberry trees, has a small silk industry, a thriving bazaar, and several mosques and *hans*; it is also the stock-breeding research-centre of the Turkish National Stud. Wheat, fruit, tobacco, walnuts, sesame, and flax are the chief products of the district.

Communications. On the Bandirma–Bursa motor-road. Another motor-road goes S. to Mustafa Kemalpaşa for Susurluk and Balikesir. A rough road leads N. across the Simav and follows the left bank to the mouth of the river.

KARAKÖSE (Karakilise). 39° 43′ N., 43° 04′ E.; alt. *c.* 5,400 ft. Ağri vil. cap. Pop. 6,250 (1935). Hydro-electric station (small).

On the right bank of the Murat branch of the Euphrates, where it turns SW. towards Malazkirt and Muş, and at the SE. end of the Eleşkirt plain, the streams of which join the Murat about 3 miles S. of the town. It formerly had a fairly large Armenian population, but these have almost entirely disappeared. A new Government house has recently been built.

Communications. On the trunk-road from Erzurum through Horasan and Eleşkirt to Bayazit and Persia. A road N. to Kağizman is reported under construction, and a rough road leads S. through Tutak to Malazkirt, Muş, and the shores of Lake Van. Aircraft landing-ground.

KARAMAN (Darende, Ak Yokuş; *class.* Laranda). 37° 10′ N., 33° 14′ E.; alt. 3,360 ft. (rly. stn.). Konya vil.: kaza. Pop. 9,050 (1935). Bank (Agricultural). Hotels (2). Hydro-electric station (small).

The town stands on gently rising ground at the S. edge of its broad plain, which is dotted with small volcanic outliers of the Kara Dağ and is occasionally marshy. Northern foothills of the Taurus rise immediately to S. Many of the houses are dilapidated, but surrounded by irrigated and walled gardens. There are two fine mosques, a beautiful *medresseh*, a medieval castle of Byzantine foundation, and the tomb of Karaman Oğlu, founder of the Karamanian dynasty.

Karaman's history is long and varied because of its position at the junction of routes from the Mediterranean coast in Cilicia and the plateau road to Konya. As Laranda it was destroyed by Perdiccas in 322 B.C., but became a pirate stronghold until it passed from Antipater of Derbe, about

79 B.C., into Roman hands. In 1190 it was captured from the Seljuks by the Crusading adventurer Frederick Barbarossa, but was held by Karaman, an Armenian convert to Islam, in fief from his father-in-law Ala-ed-Din, between 1223 and 1245. The Karamanian emirs succeeded to much of the territory of the Seljuks during their decline; they attacked Little Armenia and Cilicia and held sway from Cilicia to Phrygia and Cappadocia, but they were subdued and Karaman taken in 1466 by the Ottoman Sultan Mohammed II. With the rise of the Ottoman Empire, centred on Constantinople, and soon extending far beyond the borders of Cilicia, Karaman declined.

Communications. On the Konya–Ulukişla–Adana railway (route 9). Motor-roads NW. to Konya; NE. to Ulukişla for Adana, by the 'Cilician Gates'; and under reconstruction S. by the Gök Su to Mut, and SE. to Silifke. Tracks NE. to Karapinar (motorable in dry weather) and W. to Bozkir for Beyşehir.

KARS. 40° 36′ N., 43° 06′ E.; alt. 5,715 ft. (met. stn.). Vil. cap. Pop. 18,050 (1935). Banks (Agricultural, Business). Hotels (4). Meteorological station. Electricity station (small).

The town lies on both banks of the Kars R. in a deep rocky gorge, but chiefly on a dark basalt spur on the E. side. There are three large suburbs: Ortakapi to S., Bayram Paşa to E., Timur Paşa on W. side of the river, which is crossed by three stone bridges. Houses are mostly of black basaltic stone; there are no trees. An old fortress stands in the NW. part of the town, on a hill, almost surrounded by the river, but commanded by heights (photo. 126). There is a tenth-century Greek Orthodox cathedral.

The climate is extreme (abs. min. —32° F.; abs. max. 91° F.), with severe winters (Jan. mean 9° F.). Precipitation is slight (20 in.), mainly snow which lies for 6–8 months.

Resources. Livestock, dairy produce (including *gravyer* or *gruyère* cheese), cereals, and potatoes are the chief resources. Some cotton is grown, and coarse woollen goods, rugs, and felt are made. The Kars district has the best cattle and produces the best butter and cheese in Turkey. There is a dried-milk factory, which works for about 6 months in the year.

History. Always an important stronghold, Kars was an Armenian principality in the ninth and tenth centuries, was captured by the Seljuks in the eleventh, by the Mongols in the thirteenth, and by Tamerlane in 1387. The citadel was built by Murad III (1574–95); besieged in 1731 by Shah Tahmasp II of Persia, and in 1807, 1828, 1855, and 1877–8 by the Russians, who held it until the Russian Revolution and the Treaty of Brest-Litovsk (1918), when it passed into Turkish hands.

Communications. The old broad-gauge Russian branch-line (route 25) from Leninakan to Sarikamiş passes through Kars; and Sarikamiş is joined to Erzurum by a narrow-gauge line (route 24). The whole line from Erzurum to Kars is to be converted to standard gauge (4 ft. 8½ in.). There are motor-roads N. to Ardahan, W. to Sarikamiş for Erzurum, S. to

Kağizman, SE. through Tuzluca for Iğdir and Doğubayazidi, and NE. to Leninakan. Airfield.

KASTAMONU (Kastamuni, Kastambul; *class.* Castamon). 41° 21′ N., 33° 45′ E.; alt. 2,590 ft. Vil. cap. Pop. 13,800 (1935). Bank (Agricultural). Hotels (5). Prison. Met. station. Electricity station (medium).

The town is built on the steep sides of the upper Gök Irmak (*class.* Ammias) valley, where the river enters a fertile plain about 5 miles above its confluence with the Daday Çay (photo. 127). Most local forests have been cleared, but hills to the W. and the Ilgaz Dağ are still wooded. A Byzantine castle crowns a rocky hill NW. of the town. Most of the houses are timber-framed, with sun-dried brick walls and tiled roofs, but there are some modern buildings. There are many mosques, three of the Seljuk period, and Greek and Armenian churches. Some rock-cut chambers bear late Greek inscriptions.

The climate is healthy but extreme, with heavy winter snow. Water is plentiful and good.

Copper vessels are made, though the mines 36 miles N. of the town are now abandoned. There is a small timber trade; industries are based on leather, wool, and mohair, much of the latter being exported. A hemp factory is planned. Local supplies, which include nuts and poultry, are not very plentiful.

The town was important in late Byzantine times, mainly because of its position as a route-centre.

Communications. Kastamonu is the meeting-place of motor-roads to the Black Sea ports of Cide, Inebolu, and Sinop, and of inland roads to Safranbolu for Karabük, to Ilgaz for Çankiri and Ankara, and to Osmancik for Amasya, though this last may not yet be finished. The nearest railway stations are Karabük and Çankiri (route 11).

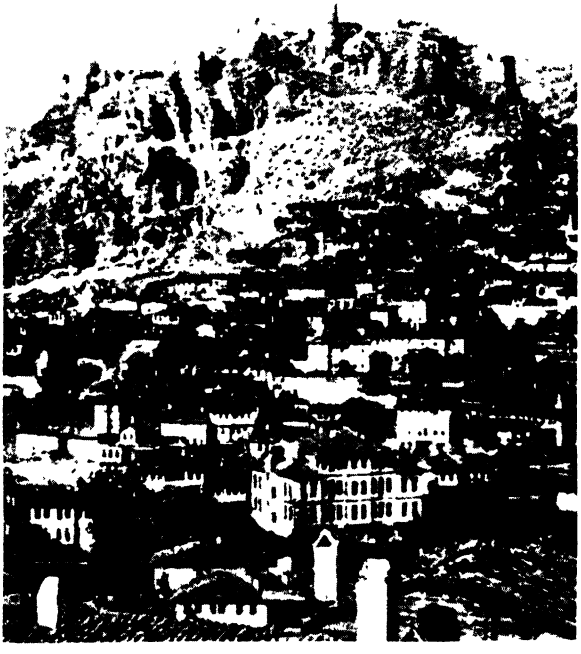
KAYSERI (Kaisarie; *class.* Mazaca, Eusebeia, Caesarea). 38° 43′ N., 35° 30′ E.; alt. 3,440 ft. (rly. stn.). Vil. cap. Pop. 53,900 (1940). Banks (Agricultural, Business, Ottoman). Hotels (3). Garages (2). Barracks. Hospitals. Museum. Hydro-electric station (medium).

The town is built at the N. foot of the Erciyas Dağ (*class.* M. Argaeus), an extinct volcano whose summit, 13 miles distant, towers 9,400 feet above the plain. There are many villages, summer residences, and a large cemetery on the lower slopes S. of the town. The Sarmisakli Su, fed by many streams, crosses the plain W. into the Sazlik marsh. It is said that on a very clear day the mountains overlooking the Black Sea and the Mediterranean can both be seen from the top of Erciyas Dağ (photos. 128, 129).

The modern town contains many well-built houses of stone, with projecting upper story of timber, but streets are narrow. There are several *hans*, bazaars, tombs, and fine mosques, the most notable mosque dating



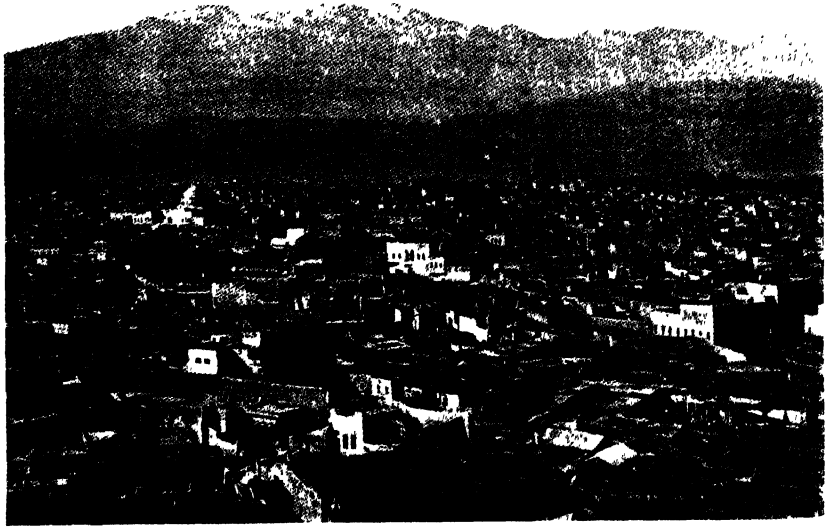
126. *Kars*



127. *Kastamonu*



128. *Kayseri. The Market Place*



129. *Kayseri, with Erciyas Dağ in the distance*

from the thirteenth century. The ruins of Mazaca, known also as Eusebeia-under-Argaeus, and in the Greco-Roman period as Caesarea, are about one mile SW. Before the Roman conquest it was the capital of the kingdom of Cappadocia. Its walls were built by S. Basil after A.D. 374, and rebuilt by Justinian (A.D. 520). On their foundations new walls were raised by Ala-ed-Din (1219–36); these were restored in 1577, and though ruined, still surround the old town (Eskişehir). The castle, which was restored in 1397, also stands on foundations laid by Justinian.

The climate is generally healthy, not severe in winter, but very hot in summer, when many residents move to houses on the slopes to the S. Drinking-water is good and plentiful.

Resources. The plain around the town is naturally arid, but abundant perennial water and fertile volcanic soil have resulted in numerous vine-yards, orchards, and gardens with irrigation. Wheat, barley, rye, and sugar-beet are grown in large quantities and the vine is cultivated. The site has always been of great commercial importance, commanding the Kizil Irmak crossing, on the highways from the Euphrates to Sinop, and from Ephesus to Syria. It is still a great distributing centre and has latterly developed into an industrial town. The State cotton-mills are the largest in the Middle East, with up-to-date amenities (p. 205). Cattle are numerous in the district, and one of the chief products is *pastirma* (jerked and dried beef), which is in demand locally and exported to other parts of Turkey. There are aircraft assembly works between the town and Talas, an ice-plant, and other factories; one is projected for canning meat. There are saltpetre works W. of the town. Fruits and their products, rugs, and woollen goods are exported.

History. Caesarea adopted Christianity at an early date. S. Gregory the Illuminator took refuge here in A.D. 257 and was consecrated first Bishop of Armenia in 302; but the town was seized by Sapor I of Persia in 268 and many of its people were massacred. It was refounded after Julian's time by S. Basil, a native of the town and bishop in 374, with churches, monasteries, and orphanages; captured and plundered in 1064 by the Seljuk Sultan Alp Arslan, and in 1243 by the Mongols. Since 1854 there has been an American Mission at Talas; in 1895 there were many Christian dignitaries, including an Armenian archbishop.

Communications. Kayseri is the rail junction for lines to Ankara and the W. (route 4), Sivas and the E. (route 5), and Ulukişla, Adana, and the S. (route 10). There are also motor-roads to these places, and to Develi (25 miles S.) whence a road is under construction to Saimbeyli. A rough road goes E. to Pinarbaşi.

KEMAH (Kemakh, Gamakh; *class.* Camacha Theodosiopolis). 39° 35′ N., 39° 04′ E.; alt. 3,412 ft. (rly. stn.). Erzincan vil.: kaza. Pop. 2,300 (1935).

On the left bank of the Upper Euphrates (Kara Su), partly enclosed by an ancient wall and gardens, and with ruins of old fortresses. The old town

with fortress was on a rock 300 feet high at the confluence of the Tenesur and Euphrates; the modern town is to SW.

Originally founded by Theodosius the Great (*c.* A.D. 400), and probably refortified by Anastasius, it became an important city of Greater Armenia, with a bishop. The fortress, known as Kamkh in the fourteenth century, was taken by the Ottoman Turks under Selim I (1512–20). The town was badly damaged by earthquake in 1939.

Communications. On the new Sivas–Erzurum railway (route 7), and with motor-road to Erzincan. There is a road bridge (No. 122) across the Euphrates, but only tracks lead north. A rough road goes W. to Iliç for Malatya and Elâziz, and a track leads S. over the Monzur Dağ to Hozat for Elâziz.

KEMALIYE (Eğin). 39° 16′ N., 38° 30′ E.; alt. *c.* 2,950 ft. Malatya vil.: kaza. Pop. 3,550 (1935).

On the right bank of the upper Euphrates (Kara Su) after the river has turned S. beyond the junction with the Çalti Su. North and south of Kemaliye, rock walls rise sheer from the river, making a crossing possible at this point alone.

A town probably with no history before Armenians settled there in the eleventh century. The population was subsequently increased by refugees from persecution, because of its inaccessibility.

Communications. Its present limited importance rests solely on the Euphrates crossing. A motor-road from Malatya and Elâziz through Arapkir to Erzincan is planned to cross the Euphrates here. The old cart-road, blasted out of the rock, runs along the water's edge below the town and requires renewal every year. A new bridge (No. 120) is under construction (1941).

KEMALPAŞA (Nif; *class.* Nymphaeum). 38° 25′ N., 27° 25′ E.; alt. *c.* 820 ft. Izmir vil.: kaza. Pop. 3,750 (1935).

In the mouth of a rocky glen, with copious water from springs which feed the Nif Çay, tributary of the Gediz. Above the town is a ruined castle, important in Byzantine times and during occupation by the Genoese. There are ancient abandoned mines of silver and antimony, but the district is now entirely agricultural.

Communications. Up the Savanda Çay to S. is the Karabel pass, on the ancient route between Ephesus and Sardis. Only a cart-track now leads by this pass to Torbali. A motor-road leads W. up the Nif valley to Izmir, and E. to Turgutlu on the railway between Manisa and Salihli (route 14).

KESKIN (Denek). 39° 41′ N., 33° 37′ E.; alt. *c.* 3,600 ft. Ankara vil.: kaza. Pop. 4,800 (1935).

Silver-lead mines are at Denekmadeni; the molybdenite mines are

worked out. The epicentre of a severe earthquake in April 1938 was on the NW.–SE. line between Keskin and Kirşehir.

A motor-road leads NW. through Kirikkale to Ankara. Rough roads NE. to Çerikli on the Ankara–Sivas railway, E. to Çiçekdağı, SE. to Kirşehir, S. and SW. to the Ankara–Kirşehir road at Kaman and Köprüköy.

KILIS (*class.* Ciliza). 36° 41′ N., 37° 08′ E.; alt. *c.* 2,100 ft. Gaziantep vil.: kaza. Pop. 24,600 (1935). Bank (Agricultural). Electricity station (medium).

The town stands in a plain drained by western tributaries of the Kuwaik Su, and is sheltered by the E. slopes of the Kurt Dağ. There are large bazaars, several *hans*, numerous mosques, and a large Armenian church. The houses are of stone with flat roofs, but poorly built. Water from well is good, and is brought also from a hill behind the town. Vine-branches are stored for fuel, which otherwise is scarce. Cereals, fruit, olives, cotton, and sesame are grown. Transport, mainly donkeys and four-horsed covered carts (*araba*), is available.

The town was a Roman site of some importance on the Urfa (Edessa)–Iskenderon road. It had an Armenian quarter until 1915, when deportations took place. It is now a frontier town close to the Syrian border.

Communications. Motor-roads NW. to Fevzipaşa, NE. to Gaziantep, and SW. across the boundary to Katma station (*c.* 16 miles) on the Fevzipaşa–Aleppo railway in Syria (route 9).

KIRKAĞAÇ (*class.* Nacrasa). 39° 06′ N., 27° 40′ E.; alt. 509 ft. (rly. stn.). Manisa vil.: kaza. Pop. 8,700 (1935). Hotel. Bank (Agricultural). Electricity station (medium).

On gentle slopes at the NE. foot of the Çamlica Dağ, overlooking a rich plain watered by the upper Bakir R. The town is well built, with broad well-kept streets. The chief products include cereals, sesame, olives, grapes, figs; the cotton and melons are noted; there is lignite in the hills.

Nacrasa was already a city at the end of the third century B.C., having probably been founded by Macedonian colonists after Alexander's campaigns; but it was not important in later history.

Communications. Kirkağaç station, on the Manisa–Balikesir railway (route 15), is below the town on lower ground. Motor-roads S. to Manisa for Izmir, N. to Soma for Bergama. A cart-track leads E. and N. to Gelenbe. There is no motor-road N. from Soma to Soğucak for Balikesir.

KIRKLARELI (Kirk Kilis(s)e; *Bulg.* Lozengrad). 41° 44′ N., 27° 14′ E.; alt. 666 ft. (rly. stn.). Vil. cap. Pop. 20,900 (1935). Bank (Agricultural). Bourse. Hotel. Military Hospital. Barracks. Electricity station (medium).

The town stands on a SW. spur of the Istranca Dağ, about 3 miles W. of

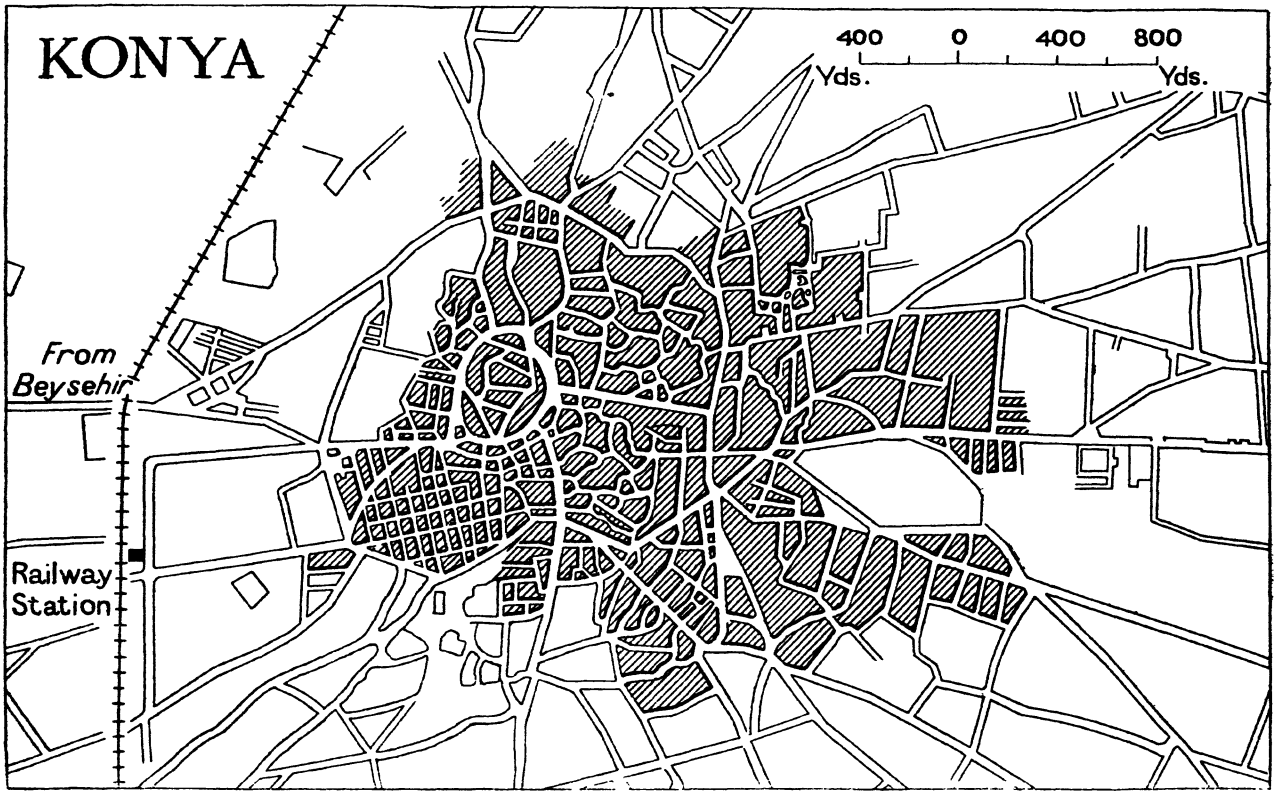


FIG. 129. *Plan of Konya*

the Babaeski tributary of the Ergene R. A stream flows SW. through the town, but drinking-water is piped from the Şeytan Su (upper Babaeski) on the NE. The town, a military station of considerable importance near the Bulgarian border, enclosed by old walls, has well-built houses, many mosques, fine vineyards, and mulberry-trees. It is the market for the Istranca highland and Black Sea coast, trading in cereals, sugar-beet, opium, and tobacco, and manufacturing cheese.

Communications. Kirklareli is the terminus of a branch-line (route *1a*) from Mandira on the Istanbul–Edirne railway. Motor-roads S. to Babaeski on the Istanbul–Edirne road, W. to Edirne, and E. through Vize and Çerkeşköy to Istanbul, with branch to Lüleburgaz. A track leads N. to Dereköy village for the Black Sea coast and Bulgaria.

KIRŞEHIR (Kirshehr; *class.* Mocissus, later Justinianopolis). 39° 08′ N., 34° 09′ E.; alt. 3,200 ft. Vil. cap. Pop. 14,050 (1935). Bank (Agricultural). Meteorological station. Electricity station (small). Barracks.

The town is in open plateau country on a tributary of the Kizil Irmak, around an ancient ruin-mound about 50 feet high. Houses are of mud-brick; there is a small bazaar, and a fine Seljuk mosque. The town was partly burned in 1876, and suffered much damage by earthquake in April 1938. There are hot springs and extensive gardens. The district produces rugs, mohair, wool, and grapes.

Mocissus does not appear in secular or ecclesiastical history till the reign of Justinian, who some time before A.D. 536 raised it to city rank under the name of Justinianopolis. Its position on the highway through Ancyra to Caesarea (Ankara–Kayseri) gave it some importance.

Communications. Kirşehir is connected by motor-road to Ankara, Yozgat, and Kayseri. The nearest railway station is at Yerköy (route 4) on the Yozgat road.

KONYA (Konia; *class.* Iconium). 37° 52′ N., 32° 30′ E.; alt. 3,373 ft. (rly. stn.). Vil. cap. Pop. 56,700 (1940). Banks (Agricultural, Business). Bourse. Hotels (4). Garages (3). Meteorological station. Malaria commission centre. Electricity station (large).

Konya stands near the W. edge of its plain on gently rising ground, backed by mountains to the W. The ruined Seljuk palace is on a low hill in the centre (fig. 129). There are many other buildings of the same period, including the mosque and tomb of Ala-ed-Din (1220–37), who rebuilt or restored the walls, the *Tekke* (monastery) of the Mevlevi Dervishes, and the tomb of the Sufi poet and mystic, Jelal-ed-Din (1207–73), which was for long an object of pilgrimage. The Seljuk walls, now ruined, had square towers, twelve gates, and a circumference of 2–3 miles. The later town has spread beyond them, particularly to E. and SE. The houses and bazaar are poor, but a fine *konak* was built in 1887, and since 1923 the

S. and W. parts of the town have been improved, and roads widened and straightened. The best suburb, with some large houses, is to the W., where an avenue with public gardens leads from the town to the railway station; but E. of the old Seljuk mound there is a maze of narrow streets (photo. 130).

Climate. Cold, fairly dry winters (Jan. m.d. min. 17° F.); hot, dry summers (July m.d. max. 86° F.). Rain mainly in spring and autumn (annual 11·5 in.).

The water-supply is good, by canal from the Beyşehir lake. There is now no malaria.

Resources. The district round Konya is naturally arid in summer and waterlogged in winter, but it has been much improved by drainage and irrigation; grain, sugar-beet, and flax are grown. Garden produce is abundant, especially fruit; the yellow plums and apricots were famous in the Seljuk period. Rugs, carpets, and fine coloured leather are made and traded. Cotton and woollen goods are woven. Local mines are worked for cinnabar and for rock-salt. There is a grain silo of 4,000 tons capacity.

History. In Roman times Iconium was the capital of Lycaonia and an important town on the southern road between Ephesus and Tarsus. It was thrice visited by S. Paul and became a Roman colony in the time of Hadrian. It rose to splendour as capital of the Seljuk kingdom of Rum. The line of Seljuk Sultans of Konya lasted from 1077 to 1300, but their residence at Konya dates from their expulsion from Nicaea (Iznik) after the first Crusade (1097), and their real power was ended by the Mongol conquest of their capital in 1257, the year previous to the fall of Baghdad. In 1472 the city fell to Mohammed II and was annexed to the Ottoman Empire. In 1832 it was occupied by Ibrahim Pasha of Egypt, but it had already declined in importance. It revived and expanded as the terminus of the old Anatolian railway in 1896 and as the starting-point for the Baghdad railway in 1902. In 1909 the Anatolian Railway Company obtained the concession for irrigating the plain. Since 1923 much traffic to S. and SE. Turkey has been diverted to the new railway through Ankara and Ulukişla, and Konya has not been modernized as much as other great towns, though its population is increasing and, as the chief centre of the Seljuks, it has sentimental importance to modern Turkey, shown by the new Seljuk Historical Museum; this occupies the *Tekke* of the Mevlevi Dervishes, whose head was said to be descended from the last Seljuk sultan. The order was dissolved and their monastery closed by the Republican Government.

Communications. The railway from Haydarpaşa, through Eskişehir and Afyonkarahisar to Adana and Aleppo, passes immediately W. of Konya (routes 8, 9); the old metalled road superseded by the railway is not in good repair, though motorable in dry weather. There are many cart-tracks leading in all directions; the road to Beyşehir is being converted into a motor-road. The airfield is about 5 miles N. of the town, on the air-route from Ankara to Adana.

KOZAN (*class.* Sis, Flaviopolis). 37° 25′ N., 35° 50′ E.; alt. *c.* 500 ft. Seyhan vil.: kaza. Pop. 5,050 (1935).

The town lies to the NE. of a steep rocky hill, which rises 1,100 feet above the plain, near a stream flowing S. to join the Ceyhan. The hill is crowned by the ruins of a medieval castle, and has rock-hewn tombs in its sides. In the town is an old Armenian monastery, built like a fortress, with fine church and palace formerly of the Gregorian Patriarch; there are two mosques, another church, and small bazaar (photo. 131).

The climate is said to be unhealthy, from marshes to the SE., and malaria is common. The district produces cereals, fruit, and vegetables.

The old name, Sis, was changed to Flaviopolis by the Romans, but restored in Byzantine days.[1] The town was afterwards rebuilt, was besieged by the Saracens in 704, relieved by the Byzantines, but later taken. An outlying fortress of the Abbasids, its walls were rebuilt by Mutawakkil, grandson of Harun-ar-Rashid. It became the capital of Little Armenia after 1080, and from it the kingdom grew to include all the mountain country watered by the Seyhan and Ceyhan. It remained the capital throughout the Seljuk period and until destroyed by the Egyptian Sultan El-Melek-el-Ashraf in 1374. During the Ottoman period it was the seat of one of the two Gregorian *Katholikoi*—the other being in Russian Armenia—but it declined, and has never regained importance.

Communications. Dry-weather motor-road SW. to Adana; rough road NE. to Feke and Saimbeyli (Haçin); tracks S. to Ceyhan and SE. to Kadirli and Osmaniye.

KULA (Kovla; *class.* Opsicium). 38° 33′ N., 28° 40′ E.; alt. 2,140 ft. Manisa vil.: kaza. Pop. 8,600 (1935). Meteorological station.

On the N. margin of a small fertile plain, a few miles S. of the Gediz R. Volcanic country (*class.* Katakekaumene or Combusta) stretches N., the nearest extinct volcano being Karadevlit, NE. of the town. Some houses are of wood, ornate and brightly coloured with red tiles, others of dark volcanic rock, cemented with mud, often separated from the street by a high wall enclosing a well-paved court. Streets mainly broad and clean; some have high side-walks of mica slate, leaving a narrow unpaved track between for horses and cattle.

The climate is healthy; water-supply, mainly from wells, ample and good.

The town seems to have had no early history and to have been founded in late medieval times. It was prosperous in the eighteenth and nineteenth centuries. Its main products are cereals, cotton, leather, valonia, and wine; its chief industries wool-dyeing and the making of woollen yarn, rugs, and carpets.

Communications. Motor-road to Alaşehir in the Gediz lowland; rough roads to Eşme and to Salihli.

[1] The town was still known as Sis as late as 1912.

KÜTAHYA (Kutaia; *class.* Cotiaeum). 39° 25′ N., 29° 59′ E.; alt. 3,251 ft. (rly. stn.); 3,333 ft. (met. stn.). Vil. cap. Pop. 17,800 (1935). Bank (Agricultural). Hotels (4). Electricity station (medium). Barracks. Meteorological station. Hospital.

The town is at the SW. corner of its well-cultivated plain, which is drained by the Porsuk Çay; it is dominated by the detached flat-topped citadel of Cotiaeum (420 ft. above the plain) with ancient walls, mosque, and modern gardens. A side valley on the S. has dwellings and fine orchards; it divides the town into old and new quarters. The old town W. of the stream and N. of the citadel is a maze of narrow lanes; it contains the bazaar and the Ulu Cami mosque, dating from 1411. Along the foot of the hills E. of the stream the newer quarter has fairly smooth and well-paved streets and a small square. Outside the town in open ground are large barracks and military hospital (I, photo. 73, p. 160).

The climate is healthy, but winters are cold, with snow falling on the average for 34 days each year.

Resources include cereals, sugar-beet, vegetables, fruit, opium, tobacco, mohair, and hides. The famous medieval glazed pottery manufacture was revived at the beginning of the present century, and there is now a State pottery and china factory using kaolin mined locally. Other industries include rug and carpet manufacture, copper-work, dyeing, and tanning. A synthetic petroleum plant is projected.

Communications. On the railway (route 16) from Balikesir to Alayunt on the Eskişehir–Afyonkarahisar line. Motor-roads to Afyonkarahisar, Uşak, Tavşanli, and to Inönü for Eskişehir, Ankara, Bursa, and Izmit.

LÂDIK (Iladik; *class.* Laodicea Pontica). 40° 55′ N., 35° 54′ E.; alt. 3,100 ft. (town); 2,802 ft. (rly. stn.). Samsun vil.: kaza. Pop. 3,850 (1935).

To the S. of a rich plain in a re-entrant of the wooded Ak Dağ, about 5 miles W. of Lâdik Göl. A ruined fort crowns a high rock behind the town, which has stone-built houses. Probably founded by Mithridates VI of Pontus in the first century B.C., and of considerable importance in Seljuk times (12th century A.D.); now only a small town with a small trade in wine. It has one fine mosque of great beauty built by Ahmet Köprülü in the reign of Mohammed IV (17th century).

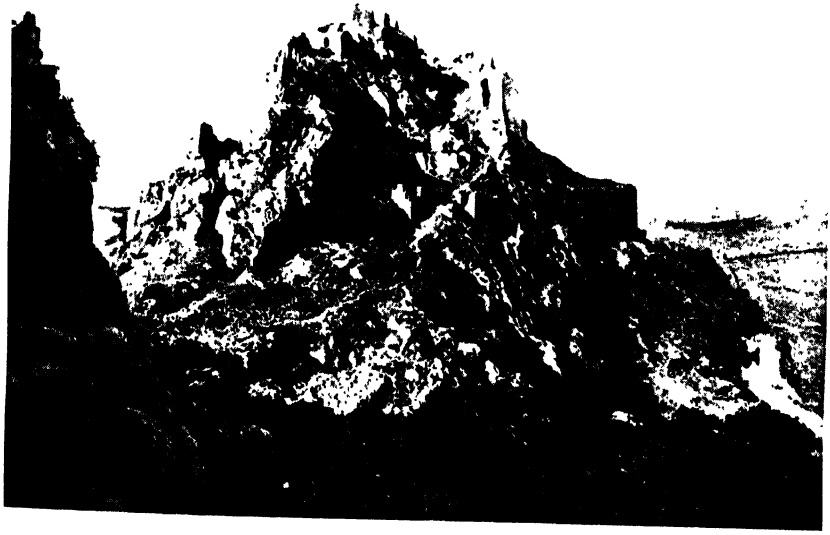
Communications. Lâdik is off the historical route from Samsun to Amasya and Sivas, but Lâdik railway station, 7 miles distant, is on the railway (route 12), and is reached by motor-road, which continues E. through the Destek defile to Niksar and the Kelkit. The projected northern railway from Adapazari to Erzurum should increase its importance.

LICE (Lijje). 38° 29′ N., 40° 39′ E.; alt. *c.* 3,600 ft. Diyarbekir vil.: kaza. Pop. 5,600 (1935).

A large village in the uppermost valley of the Batman Su, on the lower



130. *Konya*



131. *Kozan. The Castle*



132. *Mardin from the south-east*

slopes of the Kum (Koz) Dağ (Kurdish Taurus), about 300 feet above the plain level, surrounded by gardens and trees. The slopes of the Kum Dağ to N. are steep and rocky, thinly covered with brushwood. Inhabitants are Kurds. To S. a level cultivated valley takes the bridle road to Diyarbekir (47 miles), for which Lice acts as a summer hill-station. There are bridle paths SE. to Silvan (Farkin) and the Batman bridge, NW. to Palu on the Murat, and E. to Kulp (Pasur).

LÜLEBURGAZ (Lule Burgas; *class.* Bergula, Arcadiopolis). 41° 25′ N., 27° 21′ E.; alt. 157 ft. (rly. stn.). Kirklareli vil.: kaza. Pop. 11,500 (1935). Bank (Agricultural). Hotels (4). Meteorological station. Electricity station (medium).

In European Turkey, on the Monastir (Burgaz) tributary of the Ergene R., about 5 miles from the confluence, in a fertile corn-growing district; to the S. the valley is marshy in winter. Probably founded by Theodosius the Great; in 431 subject to the bishop of Bizye (Vize), and later an archbishopric. Now a garrison town with artillery barracks, and notable mosque of Sokullu Mehmet Paşa.

Communications. On the trunk motor-road from Istanbul to Edirne, with motor-road connexion to its station on route 1. There is motor-road connexion with Pinarhisar on the northern road from Kirklareli to Saray, whence Iğneada on the Black Sea can be reached.

MALATYA (Malatia; *class.* Melitene). 38° 21′ N., 38° 19′ E.; alt. 3,002 ft. (rly. stn.). Vil. cap. Pop. 38,000 (1940). Banks (Agricultural, Business, Ottoman). Hotels (4). Meteorological station. Hydro-electric station (medium). Barracks.

Malatya stands in a wide belt of gardens at the N. foot of the Şakşak Dağ, which is part of the Anti-Taurus, and about 12 miles SW. of the junction of the Tohma R. and the Euphrates. It overlooks the fertile irrigated plain to the N. and occupies an important strategic position at the Euphrates crossing of the historic route by the Tigris and Diyarbekir (Amida). The old town (Eskimalatya, *class.* Melitene) is 5 miles NE. and has few inhabitants. It was ruined by Hafiz Pasha in 1838, and its inhabitants moved permanently to their summer quarters (Aspuzu) and built the new town. This was rebuilt after earthquake in 1893 and contains fine public buildings; it is clean, with wide paved streets, and two-storied brick houses in walled gardens; but it suffered severely again by earthquake in 1939.

Winters are cold and cloudy, with light snow (Jan. mean 29° F.); summers hot and sunny (Aug. mean 80° F.). Water is plentiful from hill streams.

Resources. The principal products are fruit (especially peaches, apricots, and grapes), opium, tobacco, cotton, furs, and tragacanth. Fruit is canned. Spinning and weaving are among the industries, and there are State cotton-mills, and a mineral-water factory.

History. Melitene in Cappadocia was originally one of two legionary camps, founded by Vespasian in A.D. 72 to keep watch on the Euphrates routes and to protect the eastern frontier. It was given municipal status by Trajan. Later it became an important Moslem fortress against the Byzantines, protecting the Tohma bridge and the Euphrates crossing to the Upper Tigris, and was more than once lost and retaken. Rebuilt as Malatiyah in 756 by order of the Caliph Mansur, who gave it a fine mosque and a garrison of 4,000 men, it was already famed for its fruit; in the thirteenth century the Arab geographer Yakut counts it as 'Greek'; in the fourteenth Mustawfi speaks of it as a fine town with strong fortress, and famous for its corn, cotton, and abundant fruit. Malatya was the birthplace of the present President of the Republic of Turkey, General Ismet Inönü.

Communications. Malatya is the junction of railways from Fevzipaşa, Diyarbekir (route 22), and Çetinkaya (route 23) for Sivas and Erzurum. Motor-roads N. to Sivas, E. to Elâziz for Diyarbekir, SW. to Maraş for Fevzipaşa and Gaziantep.

MANAVGAT. 36° 47′ N., 31° 25′ E.; alt. *c.* 100 ft. Antalya vil.: kaza. Pop. 950 (1935).

A large village about 3 miles from the mouth of its river (*class.* Melas) and from the ancient Pamphylian port of Side (now Selimiye or Eski Antaliye), forerunner of Attalia (Antalya). A new all-weather motor-road follows the coastal plain W. to Antalya; a similar road, completed in 1940, goes N. through Akseki and Beyşehir to Konya; cart-road SE. to Alanya; track to landing-place at Selimiye.

MANISA (*class.* Magnesia ad Sipylum). 38° 37′ N., 27° 28′ E.; alt. 164 ft. (rly. stn.). Vil. cap. Pop. 37,700 (1940). Banks (Agricultural, Business, Ottoman). Bourse. Hotels (5). Malaria commission centre. Meteorological station. Electricity station (medium).

The town lies at the foot of the Manisa Dağ (*class.* Sipylus) on the S. edge of the Gediz plain almost opposite the confluence of the Kum Çay. Three streams traverse the town and unite N. of the railway as a tributary of the Gediz. The citadel is on a height; the modern town at the foot of the ancient walls; the bazaar central and well supplied; the railway junction at the NE. end. There are several fine mosques dating from the fifteenth and sixteenth centuries—the Ulu Cami was originally a Byzantine church—and other Seljuk and Ottoman buildings and monuments. Numerous wells give a good water-supply.

Resources. Products include grapes, sesame, tobacco, cotton, clotted cream; there are vine nurseries and wine-presses, brick works, a small timber trade, and lignite mines near by. It is said that the word 'magnet' is derived from the lode-stone for which Magnesia was noted in the past. There is good grazing in the Gediz plain.

History. Magnesia was probably a Lydian foundation of the fifth century B.C., later settled by Macedonian colonists after Alexander's campaigns. It frequently appears in classical literature and in the first century A.D. withstood attacks by Mithridates of Pontus. In A.D. 1204 it was occupied by John Ducas, who made it a temporary seat of Byzantine government. It was a fine city standing on a hill-side, surrounded by many gardens with abundant streams, and the capital of the Turkoman Emir Saru Khan in 1313. Ottoman rule began under Bayazid I in 1398, and during the campaign of Tamerlane in 1402 it was known as Maghni Siyah, the chief town of Saruhan-Ili. Ottoman Sultans had residences here until 1453, and it was later under the *derebey* Kara Osman Oğlu.

Communications. Manisa is the junction of railways from Afyonkarahisar and Bandirma to Izmir (routes 14, 15). Motor-roads to Izmir, Menemen, and to Soma for Bergama.

MARAŞ (Marash; *class.* Caesarea Germanicia; *Byz.* Marasion). 37° 35′ N., 36° 54′ E.; alt. *c.* 2,000 ft. Vil. cap. Pop. 30,700 (1940). Bank (Agricultural). Hotels (4). Hydro-electric station (medium).

Maraş lies in an amphitheatre of hills at the S. foot of the wooded Ahir Dağ above the plain of the Ak Su tributary of the Ceyhan R., upstream of their confluence. It is intersected by watercourses. The position is important as it flanks the natural routes from Syria by Antakya (Antioch) to Malatya, and from Adana to Elbistan. The ruined citadel stands on a large hill W. of the town; modern barracks lie to the N. on the road to Zeytin. Most of the houses have courtyards and gardens. The bazaar is busy and prosperous. Streets are narrow and steep, but some have been straightened and widened (fig. 130).

The climate is malarious in summer by reason of rice-growing and marsh to the S., but the higher ground near the town is otherwise healthy. There is good water from the Kirk Göz and other springs in the Ahir Dağ.

Resources. The plain is well cultivated for millet, maize, wheat, tobacco, and rice, and there are vineyards and orchards near the town. Supplies are plentiful. There is a State rice-husking mill. Kurdish rugs, leatherwork, and embroidery are made.

History. Some Hittite remains have been found, and the modern name, Maraş, occurs in Assyrian records. The town was refounded as Caesarea Germanicia about A.D. 38. As Marasion it became a border town between Byzantium and Syria under the Omayyads, being rebuilt by the Caliph Mansur (8th century), later heavily fortified, and refortified by the Abbasid Caliph Harun-ar-Rashid with double walls and a ditch. In 1097 it was taken by the Crusaders under Godfrey de Bouillon, who left it in ruins. Afterwards it was a Seljuk town and later belonged to the kingdom of Little Armenia, when it again became prosperous. Selim I (1512–20) added it to the Ottoman empire, but in late Ottoman times the Armenians

were much persecuted; many were massacred in 1915, and none live there to-day.

Communications. There are motor-roads S. and SE. to Fevzipaşa and Gaziantep, both of which link Maraş with the Fevzipaşa–Malatya railway (route 22). A track leads NW. across the Ceyhan to Göksun and then NE. to Elbistan; this is being reconstructed as a motor-road. A road W. to

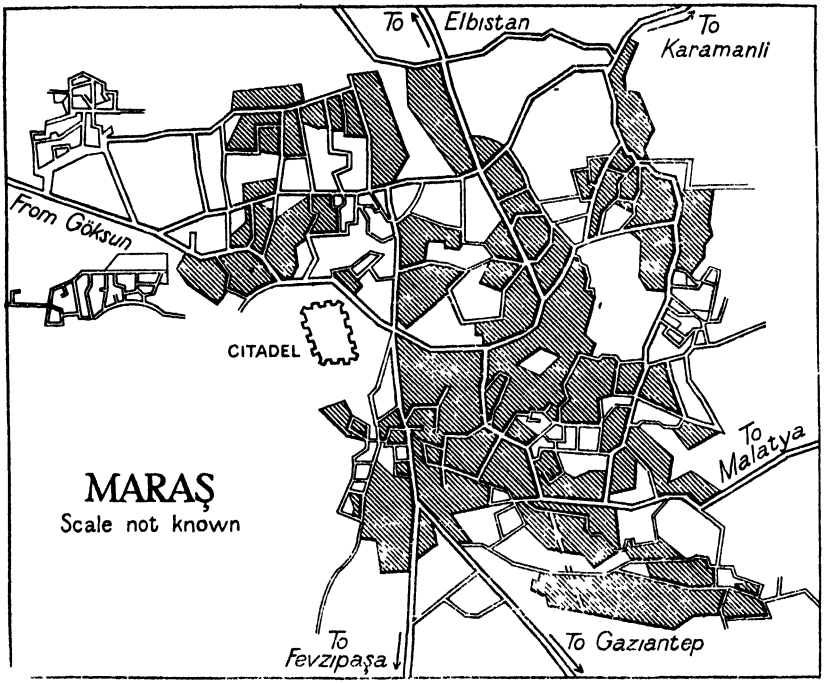


FIG. 130. *Sketch-plan of Maraş*

Andirin is under construction. Only a track links Maraş with Malatya to the NE., but this has been converted to a motor-road at the Malatya end.

MARDIN (*class.* Marde). 37° 18′ N., 40° 44′ E.; alt. *c.* 3,780 ft. Vil. cap. Pop. 22,500 (1935). Bank (Agricultural). Hotels (5). Electricity station (medium).

The town lies high up on the S. side of an almost conical limestone hill with a wide view over the Mesopotamian plain to the S. (photo. 132). On the N. and E. is the deep valley of the Zuwarik Çay; on the W. a low ridge connects it with the Mazi Dağ. Above the town is an abrupt crest of precipitous rock, supporting the ruined fortress, which forms a conspicuous landmark for 50 miles to the S. The town itself, 2 miles long on the hill-side and half a mile wide, has ruined walls. The houses, solidly built of

stone, rise in tiers, the lowest about 1,500 feet above the plain. Narrow winding streets follow the contours of the hill-side, sometimes over flat roofs, and are connected by stepped and steep paved alleys; some have been widened and straightened, and one road fit for motors passes through from E. to W.

The climate is dry and healthy. Good water is available, but not abundant, from springs, and it occasionally fails in hot summers. Wells are brackish, and every house has its cistern.

Resources. The surrounding district is fertile, producing vegetables and cereals, including some rice and millet. There are good orchards, and on the slopes outside the town are vineyards.

History. The name is probably a survival from that of an Arab tribe known to Pliny as the Mardani. The fortress was probably founded in late Roman times to protect a forward frontier. In the tenth century the castle, called Al-Baz ('the Falcon'), was the stronghold of Hamdanid princes, and by the twelfth the town and suburbs had expanded down the hill-side, with markets, *hans*, and mosques. Ibn Batuta, in the fourteenth century, described it as a fine town where much woollen stuff was woven; the fortress was then known as Kalat-ash-Shahba ('the grey castle'). About the same time the Arab geographer Mustawfi described the district as amply irrigated by a stream which drained the Sawr hill in the Tur (*Turk*: Tor) Abdin; corn, cotton, and abundant fruit were grown. The fortress successfully resisted Tamerlane about 1400. It has long been a border town between Arab and Kurd, and the headquarters of the Jacobite sect whose head ('the patriarch of Antioch') lived at Deir Zafran monastery in the valley E. of the town. In the nineteenth century it had many mosques and churches and an American Protestant mission; in the early twentieth about half the inhabitants were Christian, but most of these were deported during the War of 1914–18.

Communications. Mardin station, in the plain about 2½ miles S. of the town, is the terminus of a branch line from Derbesiye on the Aleppo–Nusaybin railway (route 21). A narrow-gauge extension climbing the valley and hills W. of the town is shown on maps. An extension of the standard-gauge line to Diyarbekir has been projected (p. 257). There is an airfield near the station. A motor-road leads NW. to Diyarbekir, and unmetalled roads go to Viranşehir, Derbesiye, Nusaybin, and Midyat.

MENEMEN (*class.* Temnos). 38° 36′ N., 27° 04′ E.; alt. 66 ft. (rly. stn.). Izmir vil.: kaza. Pop. 13,400 (1935). Bank (Agricultural). Hotels (6). Meteorological station. Electricity station (small).

At the foot of the Yamanlar Dağ, at the head of the Gediz delta and on its S. bank, among gardens and fig orchards. Most of the houses are of stone, or stone and wood; the streets are wide. It was important in late Byzantine times.

Products include cereals, cotton, liquorice, vegetables, fruits, olive oil,

onion seed, valonia, and sesame. Drainage and irrigation schemes have recently been completed. There are flour-mills and several brickworks in the district.

Communications. On the Izmir–Manisa railway (route 14) for Balikesir, Bandirma, and Afyonkarahisar. Motor-roads to Izmir, to Foça, to Aliağa for Dikili and Bergama, and to Manisa for Soma and Bergama.

MERZIFON (Marsivan; *class.* Phazemon). 40° 52′ N., 35° 35′ E.; alt. 2,464 ft. (met. stn.). Amasya vil.: kaza. Pop. 13,050 (1935). Electricity station (medium).

The town lies on the broad S. slope of the wooded Tavşan Dağ, which protects it from cold N. winds. Southwards spreads a rich plain with several villages, bounded 20 miles E. by the Ak Dağ, snow-covered in winter. The town is prosperous, well kept, with paved streets, active bazaars, and comfortable *han.*

Winters are cold and dry (Jan. m.d. min. 24° F.), with frosts severe at times, and lasting into May; summers hot and dry (July m.d. max. 78° F.; abs. max. 102° F.), but nights are cool.

Resources. The plain is fertile, irrigated, and well cultivated. There are good vineyards and orchards and excellent walnut trees. Opium from the poppies grown near Gümüşhaciköy is an important export.

History. Though deriving its name and possibly its site from the Pontic village of Phazemon, which may have become important for a short time in the first century B.C., Merzifon has little recorded history. In the nineteenth century it was the centre of American mission enterprises in the Sivas vilâyet, with Anatolia College, theological seminary, and various intellectual and cultural activities; there were also schools established by the Jesuits and by the Gregorian Armenians. Few of these activities survived the War of 1914–18, but there was still a small body of American missionaries in 1936, and a school was still functioning. Some of the buildings of the Anatolia College had been taken over by the military authorities.

Communications. Merzifon is connected by motor-road to Havza on the Sivas–Samsun railway (route 12), and with Amasya in the SE., Çorum in the SW., and with the lateral road to Adapazari through Gümüşhaciköy in the W. A rough road leads S. to Mecitözü. Merzifon is a training centre of the Turkish Air Force, with airfield and training aircraft.

MIDYAT (Midyad, Medeat). 37° 26′ N., 41° 23′ E.; alt. 3,120 ft. Mardin vil.: kaza. Pop. 7,500 (1935).

On the southern side of the watershed of the Tur (Tor) Abdin plateau, this small town is wholly dependent on rainfall. Water is collected in cisterns, and in drought must be brought from villages 4 hours distant. Provisions are sufficient for local needs, except in bad years, when food is brought from Nusaybin and Beşiri. Before the War of 1914–18 it was

prosperous, with a population mostly of Jacobite Christians. Wheat, barley, millet, large quantities of grapes, and even some rice were grown.

Communications. On the rough, winding road between Mardin and Cizre, with tracks N. to Hasankeyf (*Kurd.* Iskif) on the Tigris and S. to Nusaybin on the railway (route 21).

MILAS (*class.* Mylasa). 37° 19′ N., 27° 48′ E.; alt. 185 ft. Muğla vil.: kaza. Pop. 8,100 (1935). Banks (Agricultural, Business). Hotels (2). Electricity station (small).

The town lies at the E. foot of the hills between its plain and that of Selimiye (Mandalya), spreading up the slope and into a valley to NW. Streets are narrow. Water is plentiful from streams, and there is a spring near an ancient mausoleum in the valley. There are flour-mills, olive-oil and soap factories, and fine lemon- and orange-groves. The Milas plain is completely silted and still marshy. There are several emery mines in the neighbourhood.

Mylasa was an ancient Carian town and, later, capital of a native principality, under Persian overlordship, until Alexander's conquest in 334 B.C. It remained in Byzantine hands throughout the Saracen and Seljuk periods, and in the fourteenth century was described by Ibn Batuta as a large city with fine gardens and much fruit. Its carpets (Melhaz) were famous.

Communications. A short branch road connects it with the Ahiköy–Bodrum motor-road, and a rough road leads NW. to Selimiye.

MUĞLA (*class.* Mobolla). 37° 13′ N., 28° 22′ E.; alt. *c.* 2,500 ft. (met. stn.). Vil. cap. Pop. 11,000 (1935). Bank (Agricultural). Hotels (5). Electricity station (medium).

The town lies at the N. end of a small plain, below a flat-topped hill with medieval castle (500 ft.), protected by two ravines from the N., and commanding the countryside. The main motor-road runs from W. to E. straight through the town, but other streets are mostly narrow and winding. The houses, mainly of wood and sun-dried brick on stone foundations, extend into the plain.

Winters are very rainy (av. Dec. 11 in.) and mild (Jan.-Feb. mean. 41° F.), with some frost, and frequent mist; summers are sunny and hot (Aug. mean 82° F.). Streams from neighbouring hills provide water and drive mills in the eastern ravine.

Resources. The plain, which has no surface outlet for drainage, is marshy in winter but covered with corn crops in summer. Tobacco, olives, figs, and grapes are also grown, and there are emery and chrome mines in the district.

Communications. The Izmir–Fethiye motor-road passes through the town, with a branch S. to Marmaris and the Datça peninsula.

Muş (Mush). 38° 44′ N., 41° 30′ E.; alt. 4,920 ft. Vil. cap. Pop. 5,150 (1935).

Muş lies at the mouth of a ravine cutting back into the Haçreş Dağ of the Kurdish Taurus, overlooking its extensive plain, through which flows the Murat R. It is built on a steep mound and on the sides of the ravine, and is surrounded by vineyards and scrub-oak. It is still rather a mean town, built largely of mud, with ill-paved winding streets, a ruined castle, a few good houses, a bazaar, and a good *han*. As one traveller describes it: 'It gains from nature a little beauty which man has not the wit to give it.'

The climate is healthy, but cold in winter with much snow. The plain is fertile, and provides wheat, tobacco, and wine, though years of mismanagement have never permitted its full development. In medieval times it was noted for its fine pasture-lands, and was counted as part of Armenia; but during the last years of the Ottoman Empire the town was inhabited, like the surrounding country, by a mixture of Armenians and Kurds, and preyed upon by Ottoman official and ill-paid Turkish soldier alike. Most of the Armenians and other Christians were deported during the War of 1914–18, and the town is probably now mainly inhabited by Kurds.

Communications. Cart-roads lead N. through Hinis to Pasinler, NE. through Malazkirt to Eleşkirt, SE. for Bitlis, Diyarbekir, and Van, and W. through Çapakçur to Elâziz. The railway, already under construction, from Elâziz through Palu to Tatvan (route 27), is to pass through Muş.

Mustafa Kemalpaşa (Kirmasti). 40° 02′ N., 28° 25′ E.; alt. *c.* 150 ft. Bursa vil.: kaza. Pop. 14,800 (1935). Bank (Agricultural). Hotels (4). Electricity station (medium).

On both banks of the Kirmasti Çay, 10 miles above its junction with Lake Apolyont. A wooden bridge connects the two banks, and there are traces of fortification on the higher right bank. The river is swift, and the lower quarters of the town are liable to flood in spring.

Main products are cereals; provisions are abundant; industries include tanning, dyeing, and weaving.

Communications. Motor-roads to Susurluk on the Bandirma–Balikesir railway (route 15), and to Karacabey for Bandirma and Bursa.

Nazilli (Nasly). 37° 55′ N., 28° 20′ E.; alt. 282 ft. (rly. stn.). Aydin vil.: kaza. Pop. 12,000 (1935). Banks (Agricultural, Business). Meteorological station. Electricity station (medium).

The town lies on the N. side of the Büyük Menderes valley, in two quarters separated by the railway. Nazilli Pazarköy is higher and to the N., and was formerly the Greek and Armenian quarter; Aşağı (or 'Lower') Nazilli, formerly Büyük Nazilli, is to the S. and is older. A new plan has been drawn up for Aşağı Nazilli, laying out broad avenues and straight roads connecting them. It is not known how much has been completed,

but a number of new roads have been made and new buildings include the State cotton factory, well-equipped textile mills, and a penal reformatory.

The plain is fertile, and there is a large trade in cereals, fruit, livestock, dairy produce, olive-oil, cloth, and other produce. Water is plentiful from several streams irrigating orchards and gardens. The climate is healthy.

Communications. Nazilli is on the Izmir–Aydin–Afyonkarahisar railway (route 17), and on the road up the Büyük Menderes valley, though this requires improvement. A motor-road goes S. through Aşağı Nazilli to cross the river by a new bridge (No. 69) for Bozdoğan.

NEVŞEHIR (Nevshehr). 38° 37′ N., 34° 44′ E.; alt. *c.* 3,600 ft. Niğde vil.: kaza. Pop. 14,150 (1935). Bank (Agricultural). Electricity station (small).

The town is about 9 miles S. of the Kizil Irmak on the N. end of a spur. Oğlu Dağ rises to 5,300 feet on the E., and Keçi Kale to 4,450 feet on the W. A castle, crowning a basaltic peak, commands the town, which has good bazaars, a handsome mosque, and churches (I, photo. 81, p. 164).

Resources. The grazing-grounds are good, and well-watered valleys are cultivated. Products include vegetables, fruit, hides, mohair, and wool.

Communications. Rough roads go NW. to Arapsun on the Kizil Irmak, where there is a new bridge (No. 98), S. to Niğde, and E. to Ürgüp for Incesu (I, photo. 82, p. 164), on the Kayseri–Ulukişla railway (route 10), and Avanos, where there is another bridge (No. 99) over the Kizil Irmak.

NIĞDE (Nigdeh). 37° 58′ N., 34° 42′ E.; alt. 3,990 ft. (rly. stn.). Vil. cap. Pop. 12,400 (1935). Bank (Agricultural). Hotels (3). Electricity station (medium).

The town lies in the defile between the Melendiz Dağ on the W. and Ala Dağ foothills of the Taurus on the E., and between the plains of the Misli Ovasi on the N. and the Bor Ovasi on the S. The old town straggles over a low volcanic spur projecting SE. from the Melendiz Dağ. Buildings include a Seljuk mosque, a *medresseh* of Ala-ed-Din (A.D. 1223), a castle (A.D. 1460), and other medieval mosques and tombs. It has stone houses and narrow, winding streets, but there are extensive gardens and vineyards S. and E. of the town. The immediate neighbourhood produces grain, especially wheat, and fruit. There are marble quarries to E.

Niğde was built by the Seljuk Sultan Ala-ed-Din (13th century), but was already partly in ruins by 1350. Afterwards there was a large Greek community in the western part, and in the nineteenth century the population was estimated at 30,000. As the chief town of a new vilâyet under the Republic it is being improved, but details are not available.

Communications. On the Kayseri–Ulukişla railway (route 10). There is a motor-road S. to Ulukişla with a loop through Bor. The extension north-eastwards through Incesu to Kayseri forks N. in the Misli plain

for Nevşehir and Arapsun. A summer track links Niğde directly with Ereğli to the SW.

NIKSAR (*class.* Cabeira, Diospolis, Sebaste, Neocaesarea). 40° 34′ N., 36° 57′ E.; alt. *c.* 1,150 ft. Tokat vil.: kaza. Pop. 6,650 (1935). Hydro-electric station (small).

The town occupies the sides of a deep ravine, where the Kelkit enters the Niksar plain, and is commanded by an isolated citadel rock to N., with heavy Roman and Byzantine fortifications. The houses were well built, many of timber with flat roofs, and there were good modern bazaars, but the town suffered severely from earthquake in 1939 and 1942. The plain is marshy, water plentiful and good; rice is grown and exported.

History. As Cabeira in the ancient kingdom of Pontus it owed its existence partly to its position on the route by the Kelkit and partly to the wealth of its great temple, with high-priest and thousands of sacred serfs. When Pompey reorganized Pontus after 64 B.C. he created the city of Diospolis, and a few years later it became capital under the name of Sebaste (8 B.C.), only to change its name again on annexation by Rome in A.D. 64 to Neocaesarea, which survives in the Niksar of to-day. It was then heavily fortified and remained important, becoming one of the chief eastern towns of the Seljuk Sultans of Rum.

Communications. Niksar is at the junction of motor-roads N. to Ünye on the Black Sea, E. to Koyulhisar for Erzincan, S. to Tokat for Sivas, and W. for Havza on the Samsun–Sivas railway (route 12).

NUSAYBIN (Nisibin; *Assyr.* Nasabina; *class.* Nisibis). 37° 04′ N., 41° 12′ E.; alt. *c.* 1,640 ft. Mardin vil.: kaza. Pop. 1,950 (1935).

The town is small and stands in level ground on the right bank of the Görgarborizra Çay, with rolling country to the N. rising to the foot of the Tur Abdin plateau. On the S. an old stone bridge crosses three arms of the river. On the W. and SW. lie the ruins of the ancient city, once the important Roman frontier fortress of Nisibis, built on the site of a still older town known from Assyrian records as Nasabina. The main street is broad, but most of the houses are of mud-brick with flat roofs.

The plain is well watered and fertile. Wheat, barley, millet, and rice are grown, and sheep, horses, and camels are numerous. The Shammar and other Arab tribes come N. to the plain, but the inhabitants are mostly Kurds, with Kurdish cultivators to the E. and Arab cultivators to the S.

Water is obtained from the river, but is polluted in summer by ricefields upstream, and then is replaced by well-water. There is malaria in summer, and scorpions are common.

Communications. On the old 'Baghdad railway' from Aleppo (route 21), and at present on the only rail connexion between Turkey and Iraq. There are unmetalled but motorable dry-weather roads to Cizre (Jeziret ibn Omar), Bişhabur, Resülayn, and Mardin, and track to Midyat.

ÖDEMIŞ (Eudemish; *class.* Hypaepa). 38° 13′ N., 27° 59′ E.; alt. *c.* 400 ft. Izmir vil.: kaza. Pop. 20,750 (1935). Banks (Agricultural, Business). Hotels (3). Meteorological station. Hydro-electric station (medium).

On the N. side of the Küçük Menderes plain, embayed by southward spurs of M. Tmolus. It has a stone-built bazaar and wide main street from N. to S. It is the commercial centre of a large fertile lowland: chief products are cereals, tobacco, valonia, silk, cotton, flax, olives, raisins, and figs. Rope and sacking are made. There are arsenic, copper, antimony, and mercury mines in the district. Water is plentiful, and there is some marsh along main streams.

Communications. On the Küçük Menderes branch-line leaving the Izmir–Aydin railway at Torbali (route 17). There are unmetalled roads by Bayindir for Torbali, and for Tire; a motor-road to Adagide; and tracks to Turgutlu, Salihli, and Alaşehir in the Gediz valley, and to Nazilli in the Büyük Menderes valley.

OLTU (Olti). 40° 33′ N., 42° 00′ E.; alt. 4,200 ft. Erzurum vil.: kaza. Pop. 1,850 (1935). Meteorological station.

On the left bank of the Oltu Su, a right-bank tributary of the Çoruh. Above the town the river emerges from a rocky defile between mountains; below, the valley opens out for about 10 miles. Gardens and orchards surround the town, which has an ancient citadel.

A motor-road goes NE. by the Oltu valley to Göle for Ardahan and Kars. The hill-road SW. to Tortum for Erzurum is being made fit for motors.

OSMANCIK (*class.* Pimolisa). 40° 58′ N., 34° 50′ E.; alt. 1,300 ft. Çorum vil.: kaza. Pop. 4,200 (1935).

On the Kizil Irmak in a plain about 9 miles long and 4 miles broad, between the Ada Dağ (3,700 ft.) on the N. and Erenli Tepe (*c.* 5,000 ft.) on the S. The older main part of the town is on the right bank between a precipitous rock (450 ft.), crowned by a ruined castle, and with rock-hewn chambers. There is a fine mausoleum built by Bayazid II (1481–1512). The old town is connected to a newer quarter (*Gemici mahallesi*), on the left bank, by a stone bridge (fig. 77), 250 yards long, with 15 arches, said to have been built by the same sultan.

The plain is well cultivated with grain, fruit, and vegetables.

Occupying an important position at the point where the northern route from E. to W. crosses the Kizil Irmak, Pimolisa was already a Pontic fortress at the time of Pompey's reorganization (64 B.C.). It is the traditional birth-place of Osman, founder of the Ottoman dynasty and empire (1301), and from then till the seventeenth century was a main halting-place on the great road from Istanbul to Erzurum.

Communications. Motor-roads E. to Merzifon, for Samsun and Sivas

by road or railway (route 12); under construction to Ilgaz for Bolu and Istanbul, with branch from Tosya for Kastamonu; rough road S. to Çorum.

OSMANIYE. 37° 04′ N., 36° 15′ E.; alt. 377 ft. (rly. stn.). Seyhan vil.: kaza. Pop. 8,600 (1935).

Osmaniye lies in a small plain NE. of the Misis Dağ and at the W. foot of the Gâvur Dağ. It is a fairly new town with small bazaar and good gardens; rice-fields make it unhealthy, and water is not good.

Communications. On the Adana–Fevzipaşa section of the 'Baghdad' railway (route 9), 5 miles E. of Toprakkale junction (for Iskenderon, route 20), and 25 miles from the 'Amanus' tunnel through the Gâvur Dağ. Motor-roads roughly follow the same alinements as the railways, but are not in good repair.

PALU (*med.* Paluyah). 38° 42′ N., 39° 57′ E.; alt. *c.* 3,280 ft. Elâziz vil.: kaza. Pop. 3,650 (1935).

On the right bank of the Murat branch of the Euphrates. The river cuts deep and surrounds the town on three sides, but the valley is fairly open with well-built villages, each surrounded by its lands and small park of trees. The town is built on the sides of the steep citadel rock rising 900 feet above the river, and in medieval times guarded the Murat crossing at this point.

Communications. The new railway from Elâziz E. to the Persian frontier (route 27) is expected to be completed to Palu by April 1943, but crosses the Murat to the right bank at Külüşkür, 15 miles down river. There is a cart-road from Elâziz through Palu to Muş.

SAFRANBOLU (Zafranboli). 41° 15′ N., 32° 40′ E.; alt. *c.* 1,640 ft. Zonguldak vil.: kaza. Pop. 5,600 (1935). Hotel. Barracks.

A well-built town at the junction of two streams about 2 miles from the right bank of the Araç R. in its well-cultivated valley. There are two quarters, half a mile apart; cultivated gardens along the Araç R., and vineyards. Much saffron used to be grown for export to Syria and Egypt.

Communications. Motor-roads SW. to Karabük (5 miles) on the Ankara–Zonguldak railway (route 11); N. to Bartin and Amasra on the Black Sea coast; and E. through Araç to Kastamonu.

SALIHLI. 38° 29′ N., 28° 09′ E.; alt. 358 ft. (rly. stn.). Manisa vil.: kaza. Pop. 9,150 (1935). Hotels (5). Electricity station (medium).

On the S. side of the Gediz R. and its tributary the Alaşehir (Koca) Çay, just above their confluence. The town is well built with broad streets, houses partly of wood, a three-storied town-hall, bazaar, and covered market. Chief products are cereals, livestock, hides, wool, grapes, cotton, tobacco, valonia, and liquorice.

Communications. On the railway from Izmir by Manisa to Afyonkarahisar (route 14), and on the inland motor-road Izmir–Alaşehir–Sarayköy–Antalya, partly under construction. There is a motor-road NE. to Borlu and Gördes, and track S. over the Boz Dağ to Ödemiş in the Küçük Menderes valley.

SANDIKLI (Sandykly). 38° 28′ N., 30° 16′ E.; alt. 3,507 ft. (rly. stn.). Afyonkarahisar vil.: kaza. Pop. 8,150 (1935). Bank (Agricultural). Hotels (2). Electricity station (small).

A medieval town standing on the Kûfi headwaters of the Büyük Menderes, at the E. end of a small plain and at the W. foot of the Kükürt Dağ. There are gardens outside the town and the ruins of a castle to NE. The plain is fertile and produces cereals and vegetables.

Communications. On the new railway from Karakuyu to Afyonkarahisar (route 17), which follows the general alinement of the previous motor-road. There are tracks W. for Uşak and for Çivril, and E. to Şuhut, whence a new motor-road provides a shorter route to Afyonkarahisar.

SARAYKÖY (Seraikeui). 37° 55′ N., 28° 55′ E.; alt. 361 ft. (rly. stn.). Denizli vil.: kaza. Pop. 4,250 (1935). Electricity station (small).

The town stands on the S. edge of a wide fertile plain, 3 miles S. of the junction of the Emir Çay and the Büyük Menderes. It is an important commercial centre, noted for its cereals and cotton.

Communications. On the railway from Izmir and Aydin to Denizli and Afyonkarahisar (route 17). An important motor-road crosses the Büyük Menderes 3 miles NW. of Sarayköy to Alaşehir and the Gediz, and is under construction SE. to Antalya.

SARIKAMIŞ. 40° 20′ N., 42° 35′ E.; alt. 6,897 ft. Kars vil.: kaza. Pop. 7,700 (1935).

The town is at the SW. end of a marshy valley draining into the Kars R. near Selim, with mountains rising on the W., S., and SE. to 8,500 feet. The town is straggling, with one main street, a small bazaar, and ruined barracks on the road to Kars.

Communications. Sarikamiş is the western terminus of the Russian broad-gauge branch-line from Leninakan through Kars (route 25) and the eastern terminus of the narrow-gauge line built by the Russians to Erzurum (route 24). Conversion of the latter to normal gauge was projected in 1941, but no work has been reported. There are motor-roads SW. to Horasan for Erzurum and Karaköse, NE. to Kars, and S. to the Aras at Karakurt.

ŞEBINKARAHISAR (Şarki Karahissar; *class.* Colonia). 40° 17′ N., 38° 29′ E.; alt. 4,260 ft. Giresun vil.: kaza. Pop. 7,950 (1935). Met. station.

The town—called Şebin from its alum-mines—is well built round a

high castle-rock, in the Bağarsik valley about 8 miles N. of the Kelkit R., with ruined Byzantine church, good bazaar, rock-hewn cisterns for rain-water, and subterranean passage to a spring.

The site possibly owes its early occupation to veterans of the XVth legion stationed at Satala near Erzincan, and is first known as a city in A.D. 375. The fortress later flanked the northern road from the west to Erzurum and Persia and was captured in 1473 by Mohammed II. The town was badly damaged by earthquake in 1939.

Communications. Motor-roads N. to Giresun, S. to Suşehri for Koyulhisar, Sivas, and Erzincan, and E. to Şiran for Torul on the Trabzon–Erzurum trunk road.

SIIRT (Sairt). 37° 54′ N., 41° 57′ E.; alt. *c.* 2,950 ft. Vil. cap. Pop. 16,050 (1935). Meteorological station. Electricity station (small).

The town lies on a small plateau between the Gezer and Botan rivers, with vine-covered slopes and large orchards. The houses are of stone in gypsum cement as at Mosul, and generally two-storied. Streets are crooked and ill-paved. There are old mosques, a leaning minaret of brick and stone, and a castle.

Wheat, barley, millet, and rice are grown for local use, but vineyards predominate. Firewood is brought from the districts to E., as nearer hills have been denuded.

Water is from wells and rock-cut tanks in the hills E. of the town, and often fails in summer. The best wells, outside the town to N., are lined and covered; another good well is SE. of the town. House-wells are brackish and contaminated.

Siirt, variously written in medieval times as Siird and Isirt, was sometimes, though wrongly, counted as Armenian. In the fourteenth century its smiths were famed for their copper vessels, which were exported far and wide. There were Christians as well as Moslems before 1914, but the former were massacred or driven out during the war, and the town and district since 1918 have been almost entirely Kurdish.

Communications. Siirt is not on a main route, but a motorable road goes W. over the Gezer and Paşor bridges (figs. 110, 111) to Garzan, on the Diyarbekir–Bitlis road. A railway from Siirt to Kurtalan has been suggested as a branch-line to that from Diyarbekir to Cizre (route 26), which was expected to be open from Diyarbekir to Kurtalan by the beginning of 1943.

SILIFKE (Selefkeh; *class.* Seleucia). 36° 22′ N., 33° 56′ E.; alt. 65 ft. (met. stn.). Içel vil.: kaza. Pop. 5,050 (1935). Bank (Agricultural). Hotels (2).

A small town on both banks of the Gök Su, 5 miles inland from its small port of Taşucu, with large *konak*, citadel crowning a hill (470 ft.), Greek theatre and gymnasium, and other ruins (I, photo. 40, p. 98). The

Silifke lowland is being developed; there is a government agricultural station E. of the town. The main products are livestock, timber, charcoal, valonia, and cereals.

History. Seleucia on the Calycadnus (Gök Su) was founded by Seleucus I Nicator (*c.* 300 B.C.), who drew the population from the neighbouring old Greek town of Holmi, which was abandoned. After the death of Antiochus IV it became independent until Pompey's suppression of piracy, and later part of Roman Syria. In early Moslem times it remained Christian and Byzantine (though Tarsus was an Abbasid frontier town till A.D. 965), but in 1224 it was taken by the Seljuk Sultan Kaikobad I. In early Seljuk times it was still known as Seleucia (Salukiyah in Arabic); it became Selefkeh in the Ottoman Empire and declined.

Communications. On a good metalled motor-road from Mersin with extension to Taşucu. Two difficult roads lead NW. across the Taurus to Karaman, one through Ayaş, and the other through Mut. A track follows the coast W. to Anamur, and a rough road goes inland to Gülnar, and back to the coast at Gilindire.

SIMAV (*class.* Synaus). 39° 05′ N., 28° 59′ E.; alt. *c.* 2,700 ft. Kütahya vil.: kaza. Pop. 5,850 (1935). Electricity station (small).

On the S. edge of the marshy Simavgölü plain near the source of the Simav R. and at the foot of the Simav Dağ, which separates its basin from the headwaters of the Gediz. The ancient citadel hill has the better-class houses, but most of the town is clustered round the E. and S. sides of a larger hill crowned by the Byzantine castle. The town was rebuilt after fire in 1911. The plain is fertile, and cultivated slopes rise to the wooded Simav Dağ. Provisions are plentiful, and there is some fishing in the lake 5 miles NW.

Communications. A motor-road goes SE. to the main Uşak–Gediz road which continues NE. to Kütahya, both Uşak and Kütahya being on the railway (routes 14, 16). There are cart-tracks N. into the upper Kirmasti and W. for about 15 miles down the Simav valley.

SIVAS (*class.* Megalopolis, Sebastia). 39° 45′ N., 37° 02′ E.; alt. 4,150 ft. (rly. stn.). Vil. cap. Pop. 41,250 (1940). Banks (Agricultural, Business, Ottoman). Hospital. Barracks. Museum. Meteorological station. Hydro-electric station (large).

Sivas is one of the most important towns of inland Asiatic Turkey. It stands N. of the Kizil Irmak in open ground, grouped round a small hill (140 ft.) crowned by the citadel and clock-tower, and surrounded by a belt of poplars. The finest monuments date from Seljuk times. The eleventh-century Gök Medresseh ('blue convent') is so named from the blue faïence tiles which cover its minarets; it was protected by high walls, with well-preserved great gate, delicately carved, and ornate towers.

Another *medresseh*, the Biruciye, damaged by earthquake, is now used as a school. Modern buildings include the *Konak* and the *Lise*, where Mustafa Kemal lived and held the Congress in July 1919 (I, p. 312). The whole

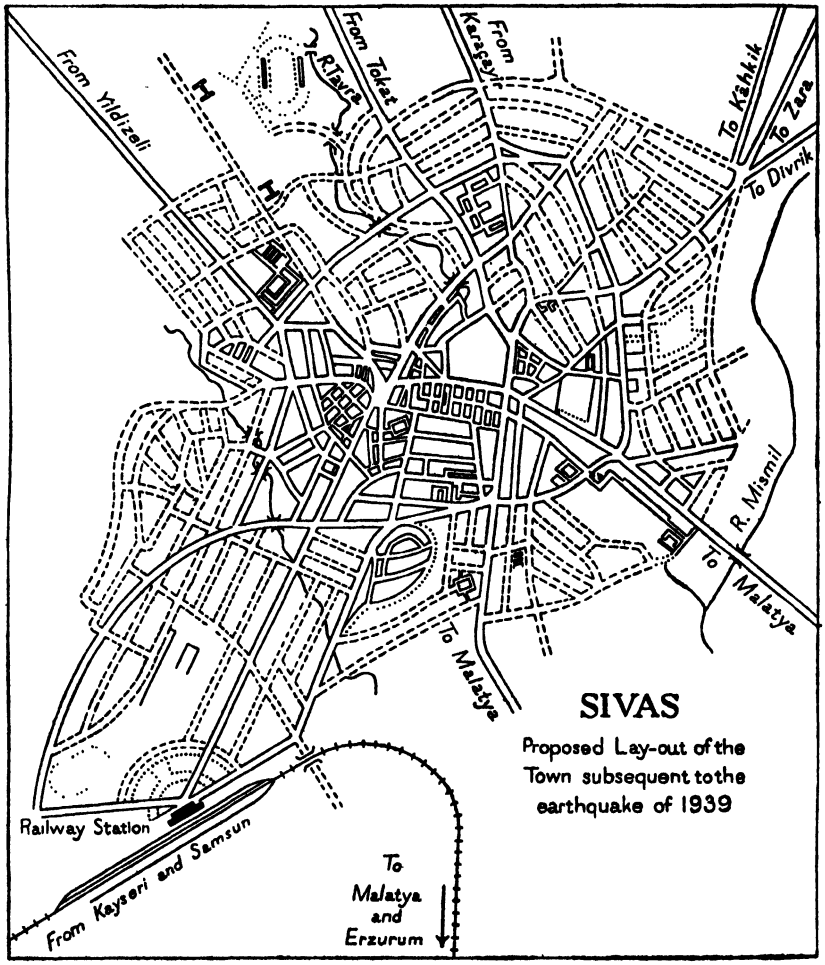


FIG. 131. *Plan of Sivas (layout after the earthquake of 1939)*

town was very badly damaged by earthquake in 1939, no fewer than 2,000 houses being destroyed and nearly 6,000 people killed. Plans for the rebuilding and extension of the town, including park, avenue leading to the station in the SW. (fig. 131, photos. 133, 134), and stadium, have since been approved.

The climate is one of extremes, with very cold winters (Jan. m.d. min.

14° F.) and hot summers (July m.d. max. 88° F.). Rainfall is scanty (14 in.), most in spring and autumn.

Resources. The district is fertile and provisions are plentiful, though fruit is brought from warmer districts. Resources include woollen goods—especially socks and rugs—cereals, flour, dried beef (*pastirma*), hides, skins, and cotton cloth. There are large cement works, and a State silo (4,000 tons).

History. The position at the junction of great routes has been of high strategic and commercial importance at all periods. The city of Megalopolis was built by Pompey about 60 B.C. and became capital of Asia Minor. It was refounded by Augustus, refortified by Justinian, and held by Armenian vassals of Byzantium from A.D. 1021, by the Daneshmand Turks from 1071, and by the Seljuks from 1172 to 1400, when it was captured by Tamerlane. Prosperous in Byzantine times, it became a centre of Moslem religion and culture under the Seljuks. Ala-ed-Din Kaikobad, the Seljuk Sultan, rebuilt the city in the thirteenth century, using hewn stone for all new masonry. A century later it was famous for its woollen stuffs, which were exported, and for its excellent markets. Tamerlane massacred the whole Christian community, which still formed the most industrious part of the population, and from his day the town never fully recovered, though the citadel was rebuilt by Mohammed I (1413–21). During the decline of the Ottoman Empire Sivas remained a backwater, secluded from world events, until Mustafa Kemal landed at Samsun in May 1919 and made it the first headquarters of Turkish nationalism.

Communications. There are railways to Kayseri, junction for Ankara and for the S. (route 5); to Çetinkaya, junction for Erzurum and the E., and for Malatya and the SE. (route 6); and to Samsun on the Black Sea coast (route 12). Motor-roads to Kayseri, Malatya, Zara for Divrik, Erzincan, and Koyulhisar, and to Yildizeli for Ankara, Samsun, and Sinop.

SIVEREK (Severek, Suverek). 37° 45′ N., 39° 20′ E.; alt. *c.* 2,790 ft. Urfa vil.: kaza. Pop. 15,150 (1935). Meteorological station.

Siverek is on the NW. skirts of the Karacali volcano, in barren rolling country, between two left-bank tributaries of the middle Euphrates. The town itself is in a slight hollow, surrounded by vineyards, with a good spring in the centre. The castle, on a platform of basaltic rock, was built by the counts of Edessa (Urfa).

Communications. Siverek is on the old post-road between Urfa and Diyarbekir, and is linked by cart-road with Viranşehir to the SE.

SÖKE (Sokia). 37° 45′ N., 27° 25′ E.; alt. *c.* 125 ft. (rly. stn.). Aydin vil.: kaza. Pop. 10,900. Electricity station (small).

Söke lies between the Gümüş Dağ and the Samsun Dağ on both sides of a torrent, overlooking eastward the lower Büyük Menderes. The old

Turkish quarter is on the left bank of the torrent, with bazaars, *hans*, *konak*, and railway station; the former Christian and Circassian quarters and the liquorice factory are on the right bank. The *hans* are good, and the houses are of wood and stone. Water is plentiful. The situation is sheltered, but the cool N. wind gives an agreeable climate in summer.

Söke is the chief market town of the lower Menderes valley and the centre of the liquorice industry. Other resources are figs and other fruit, cereals, livestock; there are local mines of emery and lead, and a factory for curing fish from the lagoons of the delta.

Communications. A branch line from Ortakler on the Izmir–Aydin railway ends at Söke (route 17). There is a motor-road over the pass NW. to Kuşadasi and Selçuk (Ayasoluk, Ephesus); and other roads NW. to Ortakler for Aydin, E. along the S. side of the Büyük Menderes valley to the Aydin–Çine motor-road, and SW. along the foot of the Samsun Dağ to Doğanbey.

SOMA (*class.* Germe). 39° 10′ N., 27° 36′ E.; alt. 443 ft. (rly. stn.). Manisa vil.: kaza. Pop. 3,800 (1935). Electricity station (small).

A small town on the wooded lower slopes of the Çamlica Dağ overlooking the upper Bakir Çay, and dominated by the ruins of a late Byzantine castle. Streets are narrow and winding. Local products include cereals, tobacco, olives, valonia, and silk. There are flour-mills and a small weaving industry.

Communications. The railway station on the right bank of the Bakir Çay is on the Manisa–Balikesir line (route 15) and is connected by motor-road with the town. There are motor-roads W. to Bergama (with motor-bus service), and S. down the Kum valley to Manisa and Izmir. The road N. to Soğucak is not passable for motors.

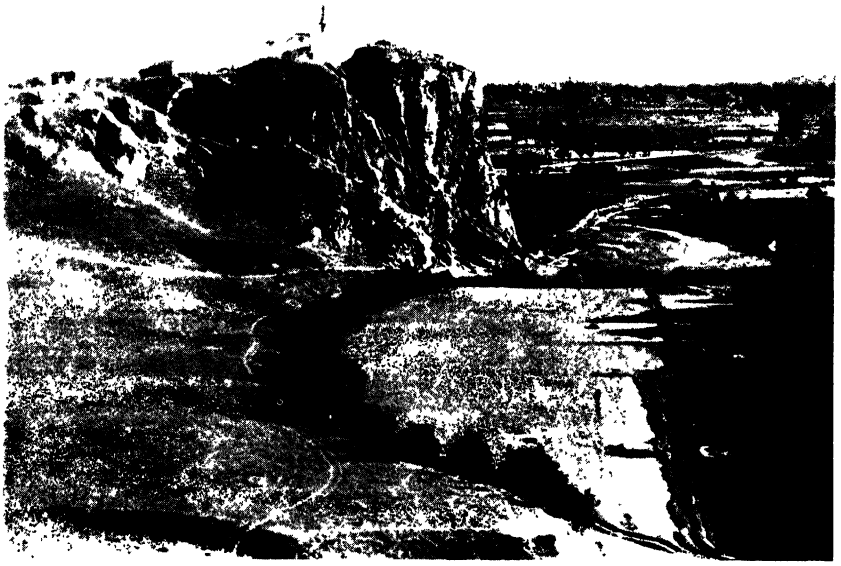
SUSIĞIRLIK (Susurluk, Susugurlu). 39° 54′ N., 28° 10′ E.; alt. 125 ft. (rly. stn.). Balikesir vil.: kaza. Pop. 5,550 (1935).

On the left bank of the Simav where the river begins to open out into the plain of lakes Manyas and Apolyont. There are several *hans*. The town is a flourishing wheat-centre and market town, and was for long an important halt on the old post-road from Bandirma to Izmir.

Communications. On the Bandirma–Balikesir railway (route 15), for Kütahya and for Izmir (routes 16, 15). Motor-roads SW. to Balikesir, N. to Bandirma with branch E. through M. Kemalpaşa for Karacabey and Bursa.

TARSUS (*class.* Antiochia ad Cydnum, Tarsus). 36° 55′ N., 34° 54′ E.; alt. 69 ft. (rly. stn.). Içel vil.: kaza. Pop. 24,400 (1935). Banks (Agricultural, Business, Ottoman). Hotels (2). Electricity station (medium).

Tarsus stands on the right bank of the Tarsus Çay (*class.* Cydnus), about 10 miles from the sea, surrounded by irrigated gardens. The silt of



133. *Sivas. Southern outskirts and road to the south*



134. *Sivas. General view*



135. *Tarsus*

marsh and lagoon has covered the site of the ancient port, excepting a few traces of its walls, the Byzantine castle, and the Dunuk Taş monument. The modern town is well built and has a bazaar, mosques, church, and cotton factories (photo. 135). The 'American College', formerly St. Paul's College, has a staff of American teachers and works under the supervision of the Turkish Ministry of Education. There is a barrage, on the Tarsus R. north of the town, which controls irrigation, and there are extensive gardens and citrus plantations.

The climate is oppressive and tends to be unhealthy from marsh to the SW. Cholera has been prevalent in the past. The main products are cotton, sesame, maize, cereals, and citrus fruit.

History. The foundation of Tarsus has been attributed by legend to Perseus, Heracles, Semiramis, and to other figures of the heroic age. It was probably colonized as a sea-port by Phoenicians and Greeks, and almost certainly rebuilt by Sennacherib of Assyria in 698 B.C. after a campaign against the Greeks. It was taken by Alexander the Great (333 B.C.), who almost died of fever contracted from bathing in the Cydnus on a hot day. In the Seleucid kingdom it became Antiochia, a port near the mouth of the Cydnus, and under Pompey's settlement the capital of Cilicia (64 B.C.). For a short period, because of its sympathies with Caesar, it bore the name of Juliopolis, and under Augustus was one of the great seats of learning of the pagan world. It is best known as the birth-place of S. Paul, after which it frequently reappears during the early Parthian campaigns. During the Arab period it was the southern and most important fortress on the frontier stretching from Malatya through the Anti-Taurus to the sea, and, like others in the line, frequently changed hands between Byzantines and Moslems. Its importance rested on its position commanding the southern entrance to the Cilician Gates;[1] it was strongly fortified by the Caliph Harun-ar-Rashid, and in the tenth century it was surrounded by a double stone-wall, pierced by six gates and surrounded by a deep ditch. At that time it was said to have had a garrison of 100,000 men collected from all parts of the Abbasid Empire; and from the Bab-el-Jihad (the 'Gate of the Holy War') yearly Moslem expeditions sallied out against the Christians.[2] Tarsus was the frontier city of Islam until 965, when it was taken after siege by the Byzantine emperor Nicephorus Phocas, who burnt all the Korans and destroyed the mosques. It remained in Christian hands during the early crusades, its possession disputed by Tancred and Baldwin. It was refortified by Leo II and by Hethum I, kings of Little Armenia in the 13th century, and passed to Ottoman hands under Bayazid I (1389–1402).

Communications. On the line from Mersin to Yenice (route 19) on the

[1] The position of Tarsus relative to the Cilician Gates was very similar to that of Peshawar and the Khyber pass on the NW. frontier of India to-day.

[2] The ransoming of Christian and Moslem prisoners took place on the river Lamos (*Arab*: Nahr el Lamis, now Lamas Çay), between Silifke and Tarsus.

'Baghdad railway' (route 9) between Ulukişla and Adana. Motor-roads SW. to Mersin for Silifke, N. through the Cilician Gates to Ulukişla, NE. to Adana; cart-road SE. to Karataş.

TAVŞANLI (Taushanli). 39° 33′ N., 29° 30′ E.; alt. 2,700 ft. (rly. stn.). Kütahya vil.: kaza. Pop. 5,350 (1935). Electricity station (small).

On the right bank of the Koca R. where the depression eastwards from Balikesir opens out to form a marshy plain about 10 miles long and 5 miles broad. The town is on the lower slopes of the wooded Yaylacik Dağ and is well built. Cereals, fruit, and vegetables are grown, and there are chrome mines in the district.

Communications. On the Balikesir–Kütahya–Alayunt railway (route 16). Motor-road SE. to Kütahya. Rough roads NW. to Orhaneli and N. to Inegöl. Tracks NW. to Eşen and Kürt, and W. to the Döldik mines (with aerial ropeway).

TIRE (Tira; *class.* Arcadiopolis, Teira). 38° 05′ N., 27° 44′ E.; alt. *c.* 350 ft. Izmir vil.: kaza. Pop. 20,450 (1935). Bank (Agricultural). Hotels (5). Electricity station (medium).

A large town on the S. side of the Küçük Menderes (*class.* Cayster) valley at the foot of M. Messogis, among vineyards, orchards, and gardens. It was formerly an important caravan-halt, market town, and capital of the Aydin Emirs. The railway has restored its prosperity as a collecting centre and local market for olive-oil, raisins, figs and other fruit, wheat, rice, cotton, tobacco, and flax. Water is plentiful and the neighbourhood very fertile.

Communications. Tire is on a short branch line from Çatal on the Torbali–Ödemiş branch of the Izmir–Aydin railway (route 17). The best motor-road is W. along the hills S. of the Küçük Menderes to Torbali, but the roads N. and E. to Bayindir and Ödemiş are passable for cars; the road S. to Aydin, part of the Izmir–Fethiye trunk road, is only an earth track unless it has recently been reconstructed.

TOKAT (*class.* Dazimon). 40° 19′ N., 36° 34′ E.; alt. 2,130 ft. Vil. cap. Pop. 21,250 (1935). Bank (Agricultural). Hotels (2). Hydro-electric station (medium).

The town, well built and clean, stands in an amphitheatre among gardens on the left bank of the Yeşil Irmak (here called Tozanli Su), at the E. end of the Kaz Ova, a wide fertile plain. The late Byzantine castle on a precipitous limestone hill to W. has a rock passage leading down to water, as at Amasya and Turhal. Houses of wood, with low red-tiled roofs and deep eaves, and gardens cover the sides of the amphitheatre. It has numerous Seljuk and early Ottoman monuments (photo. 136).

Resources. Provisions, especially fruit, are abundant. Cereals, tobacco, opium, fruit, and hemp are grown. Production is increased by irrigation.

Cotton cloth is woven and copper utensils are made; a little iron, manganese, and kaolin are mined locally.

History. Dazimon seems to have been little more than a village settlement in classical times, but in the Middle Ages became an important road centre and the appanage of a Seljuk prince, with large bazaar and good *hans*; caravans came from Persia, from Baghdad by Diyarbekir, and from Constantinople and Smyrna.

Communications. Tokat is the junction of motor-roads S. to Sivas, NE. to Niksar in the Kelkit valley, and W. through Turhal on the Samsun–Sivas railway (route 12) to Amasya.

TOSYA (*class.* Docea). 41° 02′ N., 34° 01′ E.; alt. *c.* 2,460 ft. Kastamonu vil.: kaza. Pop. 10,050 (1935). Hydro-electric station (small).

The town lies in a small valley and on the SE. slopes of the Ilgaz Dağ, above the *ova* drained by the Devrez tributary of the Kizil Irmak. There is a fine mosque and a good *han*. The gardens produce choice grapes, and good rice is grown in the *ova*, which is marshy. There is a State rice-mill, and strong cloth is woven from mohair, wool, and cotton.

Communications. Motor-roads N. to Kastamonu, E. along the *ova* to Kargi and Osmancik for Amasya, and under construction W. to Ilgaz for Çankiri or Kurşunlu on the Ankara–Zonguldak railway (route 11).

TURGUTLU (Kas(s)aba, Cassaba; *class.* Caesarea Trocetta). 38° 30′ N., 27° 42′ E.; alt. 223 ft. (rly. stn.). Manisa vil.: kaza. Pop. 21,700 (1935). Bank (Agricultural). Hotels (4). Barracks. Electricity station (small).

The town stands at the S. edge of the Gediz plain (Kasaba Ovasi) about 4 miles from the river, at the foot of the Tmolus mountains. It is well built, with trees in the squares and streets; houses are of stone or sun-dried brick; gardens are irrigated.

Resources. Several streams descend from S. and supply abundant good water. The broad fertile plain is richly cultivated with cereals, orchards (which spread up the slopes), vegetables, tobacco, cotton, opium, and sesame. Silk-worms are kept on mulberry plantations; there are factories for vegetable oils and soap; but cotton and raisins are the chief exports.

Communications. On the Izmir–Manisa–Afyonkarahisar railway (route 14) and on the main road from Izmir through Kemalpaşa eastwards to Salihli for Gördes and Alaşehir.

ULUKIŞLA (*class.* Halala, Faustinopolis, near Loulon). 37° 33′ N., 34° 30′ E.; alt. 4,679 ft. (rly. stn.). Niğde vil.: kaza. Pop. 2,900 (1935). Barracks. Electricity station (small).

The importance of Ulukişla rests on its strategic position near the head of the Çakit R., where it commands both road and railway from the Seyhan lowland, and the routes both N. and W. across the plateau. It is only a small town, rather meanly built, though improvements are planned; it

derives its modern name from the great barracks (*kişla*) built by Ibrahim Pasha of Egypt in 1836 (fig. 132; photo. 137). It has no local resources or trade of any significance.

Its history can be traced back to Marcus Aurelius, who founded a Roman colony (Colonia Faustiniana, or Faustinopolis) at the village of Halala, and named it after his wife Faustina who died there. Later, numerous embassies, raiding expeditions, and couriers passed by it or stormed the

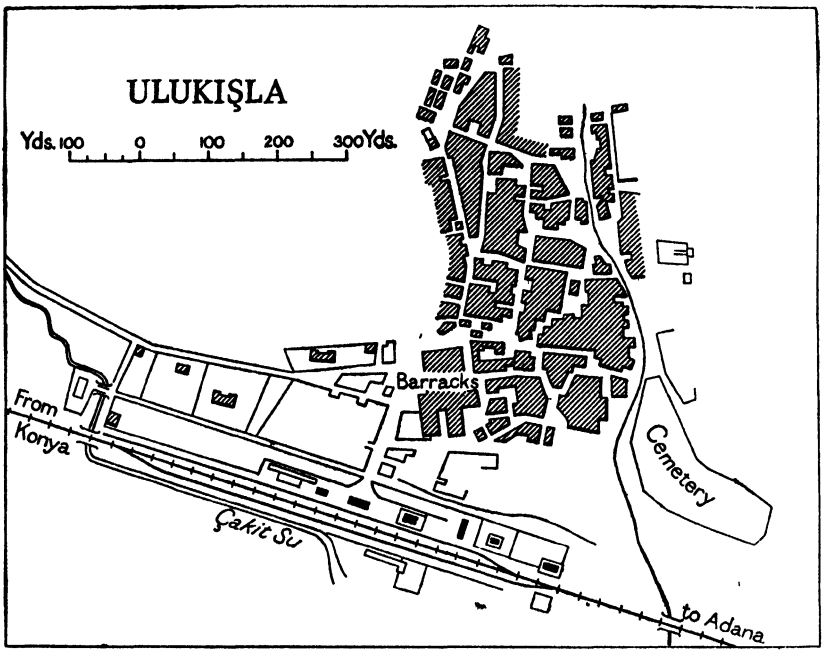


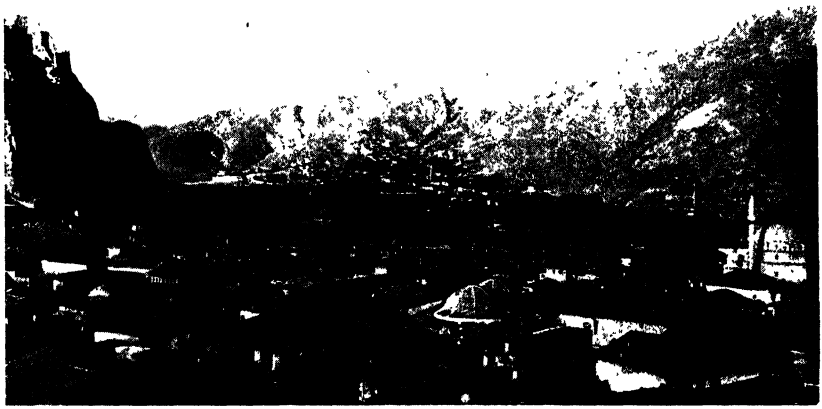
FIG. 132. *Plan of Ulukişla*

Byzantine fortress of Loulon (or Lulua) on a neighbouring height, the first signal station of a chain of beacon-fires from the Syrian frontier to Constantinople.

Communications. On the Konya–Adana section of the 'Baghdad railway' (route 9) and near the junction of the line N. to Kayseri and Ankara (route 10). The actual junction is at Kardeşgediği, 2½ miles to the west. Motor-roads E. by the Çakit defile to Pozanti and then by the Cilician Gates (Külek Boğazi); W. to Ereğli for Konya, and N. to Niğde for Kayseri.

URFA (Urfeh; *class.* Edessa). 37° 08′ N., 38° 46′ E.; alt. *c.* 1,854 ft. (met. stn.); Vil. cap. Pop. 34,850 (1940). Bank (Agricultural). Hotels (5). Electricity station (medium).

Urfa lies at the NW. corner of the Haran Düzü, the northern extension



136. *Tokat*



137. *Ulukişla and the Çakit gap from the west*



138. *Ürgüp*

of the plain of Haran (*class.* Carrhae), which is enclosed by the Nemrut Dağ to W., the Germuş Dağ to N., and the Tektek Dağlari to E. It is built at the foot of the hills and is enclosed by two bold limestone promontories, leaning against their lower slopes and spreading out towards the plain (fig. 133). The S. hill, crowned by a castle, rises precipitously; the remaining sides of the old town are enclosed by ruined walls with square towers, and surrounded by a rock-cut ditch still 30 feet wide and 40 feet deep in places. Many of the houses are well built of limestone and basalt, a rich golden brown in colour, but the streets are narrow and tortuous. Around and among the houses and streets grow cypresses and other trees. Newer and wider streets are now being cut through the old town, and an enlargement of the newer quarter north of the walls is planned on the lower slopes of the gentler northern hill.

The castle, built by Justinian, is only a shell, about 400 yards long and 60 yards broad, but imposing from its situation. Two lofty Roman columns still stand.[1] From them a wide view is obtained of the town below (I, photo. 91, p. 171). In the sides of the castle rock and elsewhere there are many grottoes and galleries, cut as tombs and later used as dwellings. At the foot is the Mosque of Abraham, near two large stone tanks with sacred fish.

Climate. Winters are mild (Jan., m.m. min. 27° F.), summers very hot (July, Aug., m.m. max. 104° F.). Annual rainfall 16 inches, mainly in winter.

Resources. In the plain much wheat is grown and there is extensive pasture. Supplies are therefore abundant. There are vineyards and orchards; fuel is scarce; twigs, vine-prunings, and olive stumps are burned. Water is abundant; strong springs feed the fish-tanks N. of the castle, Karapinar spring is farther E., others are in the hilly ground N. of the town, and in the plain to S.

History. Edessa in the first centuries B.C. and A.D. was the capital of a small buffer state between Rome and Parthia. Tradition says that its king, Abgarus of Osroene, sent messengers to Christ entreating Him to visit Edessa and cure him of leprosy, offering Him asylum from unbelieving Jews. After the Ascension, Thaddaeus, sent by Thomas to Edessa, healed the king and converted him and the people to Christianity, before passing on to Armenia and eastern Mesopotamia to found the Nestorian Church.

The Romans annexed the kingdom in the second century, and for some time it flourished as a centre of commerce and culture. A frontier fortress also, it withstood several sieges in the long-drawn wars between Sassanid Persia and Byzantium. In the Middle Ages it was taken by the Crusaders, and ruled by the Christian counts of Edessa, Baldwin and Jocelyn, from

[1] According to an ancient legend, one of the columns is full of gold and silver; the other acts as a stopper to a fountain of water capable of producing another Deluge, which would eliminate mankind.

c. 1100 until 1144, when it was besieged and captured by Zanghi Atabey of Mosul. The indiscriminate massacre of the inhabitants brought Christian domination to an end. Under Ottoman rule it had a mixed population of Kurds, Armenians, Arabs, and Turks. Many Armenians were massacred in 1896. It was held by the French for a short while after the War of 1914–18, but evacuated in April 1920.

Communications. Old roads from Birecik on the Euphrates to Viranşehir and Mardin; and from Aleppo in Syria in the SW. to Siverek for Diyarbekir. A new motor-road goes SE. to Akçakale on the Aleppo–Tel Kochek railway (route 21).

ÜRGÜP (Urgub). 38° 38′ N., 34° 56′ E.; alt. *c.* 3,450 ft. Kayseri vil.: kaza. Pop. 4,400 (1935).

Ürgüp, a large village about 7 miles S. of the Kizil Irmak, is in a deep ravine cut in the E. slopes of a plateau formed by volcanic tuff. Erosion has produced a landscape of valleys and gorges, leaving numerous cones which have been hollowed out for dwellings, monasteries, and churches (I, p. 166), many of them with fine frescoes. Houses are now built of quarried tuff, and the neighbouring caves are used for storing corn, raisins, and firewood (photo. 138).

Resources. Pigeons are kept for guano, the only fertilizer used. With this and irrigation the soil is fertile, and the grapes and apricots are noted; other fruit, grain, and vegetables are also grown, and there are many sheep and goats.

Communications. A road goes E. to Incesu on the road and railway from Ulukişla to Kayseri. Summer tracks link Ürgüp NW. with Avanos, where the Kizil Irmak is crossed by a new bridge (No. 99) on the road to Kirşehir, and through Nevşehir with Arapsun, where another bridge (No. 98) crosses the Kizil Irmak for Kirşehir.

UŞAK (*class.* Flaviopolis, Temenothyrae). 38° 41′ N., 29° 24′ E.; alt. 2,979 ft. (rly. stn.). Kütahya vil.: kaza. Pop. 17,550 (1935). Banks (Agricultural, Business, Ottoman). Hotels (3). Hospital (small). Meteorological station. Electricity station (medium).

The town lies at the junction of several head tributaries of the Gediz Çay, backed on the N. by hills covered with vineyards, and overlooking a fertile plain to the S. and SW. It was rebuilt in 1884 after earthquake and fire.

The climate is healthy. Winters are cold (Jan. mean 35° F.) with frequent frosts and snow; summers are warm (July, Aug. mean 74° F.) with chilly nights, occasional thunder, but little rain. Annual rainfall is 16 inches, most between October and May.

Resources. Local produce includes cereals, sugar-beet, valonia, and opium. There is a State sugar-factory (photo. 59), and rug-making

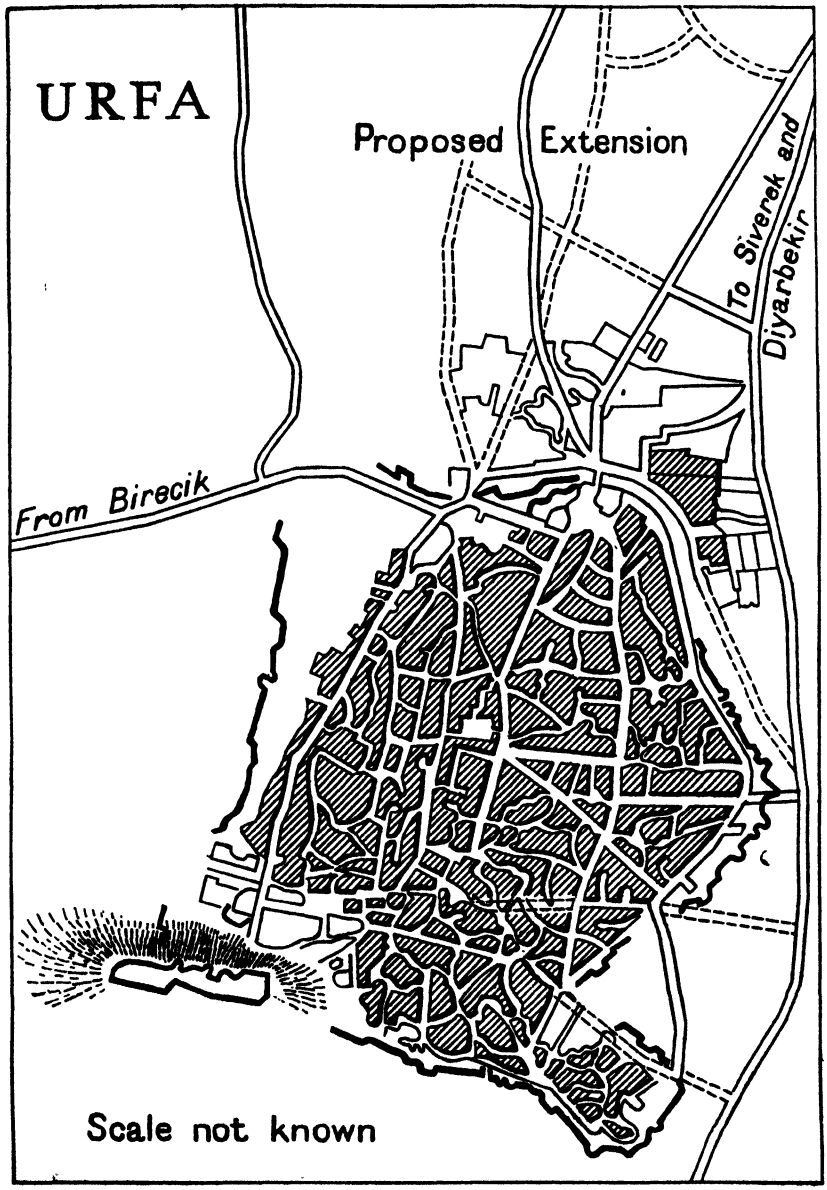


FIG. 133. *Plan of Urfa*

from local wool has long been a notable industry (p. 233). Water is plentiful from the river and from springs.

Communications. Uşak is on the historic route from Izmir to the Central Plateau, now traversed by the Izmir–Manisa–Afyonkarahisar railway (route 14). A motor-road leads N. through Gediz to Kütahya, with branches to Simav and Emet. Cart-roads go SW. through Eşme to Kula for Alaşehir and Salihli; S. through Çal to Denizli; SE. to Çivril; and E. to Afyonkarahisar.

UZUNKÖPRÜ. 41° 16′ N., 26° 41′ E.; alt. 115 ft. (rly. stn.). Edirne vil.: kaza. Pop. 9,450 (1935). Banks (Agricultural, Business). Hotels (2). Meteorological station. Electricity station (medium).

The town is built on the left bank of the Kirk Kavak tributary of the Ergene R., which is here marshy, and takes its name from a 'long bridge' over that river. Its importance rests on its position commanding the causeway and road bridge over the Ergene, and close to road and railway bridges at Kuleliburgaz over the Meriç (Maritsa). Oak scrub offers the only fuel and there is no timber for bridging purposes. Local resources are mainly livestock, hides, and skins.

Communications. Motor-roads S. through Keşan for Gelibolu and Tekirdağ; NE. through Kircasalih to Havsa on the Istanbul–Edirne road; N. through Kurt Tepe to the Istanbul–Edirne road; and NW. across the Meriç to Kuleliburgaz station, junction on the Istanbul–Edirne line for the Greek branch to Dedeağaç.

VAN (*class.* Urartu, Thospia). 38° 28′ N., 43° 21′ E.; alt. 5,740 ft. Vil. cap. Pop. 9,350 (1935). Barracks. Prison. Electricity station (small).

The town stands in a plain about 5 miles long from N. to S., and up to 8 miles W. to E., bounded on the N. and S. by hills with easy passes, and backed on the E. by the Varağ Dağ, which rises 4,000 feet above it (I, figs. 46, 48, pp. 187–8.) A fringe of marsh a mile wide separates the town from the shore of Lake Van. Two isolated rocky hills stand up from the plain: one crowned by the citadel (360 ft. above the plain), and about 1,100 yards from the lake; the other, Zemzem Dağ, about 3 miles ENE., with its flat-topped Toprakkale spur overlooking the N. suburbs. Immediately S. of the citadel rock is the walled town, with residential garden quarters to E. and S., where the houses lie in clusters half hidden by trees and fruit orchards.

The walled town was formerly enclosed by a double line of fortifications with ditch and covered way. But by 1904 the outer wall could only be traced on the E. face, the principal feature being the Tabriz Gate. On the E. and S. faces the inner wall was about 18 feet high, 15 feet thick, and with banquette 10–15 feet wide. The semicircular bastions were in ruins. On the SW. side the walls had been destroyed and on the NW.

face partly demolished. The Tabriz Gate lies close under the SE. corner of the citadel rock. Within the walls the streets are narrow and winding, and houses and bazaars crowded together; but the Government offices and barracks were within the walls.

The citadel rock runs the whole length of the walled town, its S. face precipitous, its N. side sloping at about 45° and easy to climb. There are tracks up the W. and E. ends, and a rock staircase leading from the town

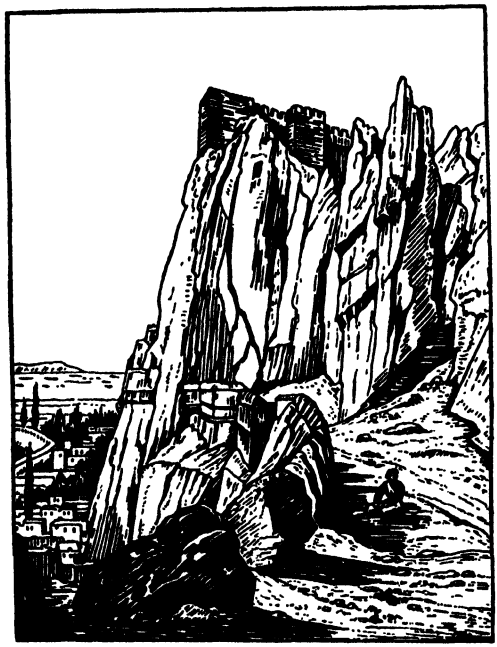


FIG. 134. *The Citadel of Van*

up the S. face to the central citadel which occupies the highest summit, half-way between either end (fig. 134). A line of masonry walls 25 feet high, with bastions at intervals, protects the crest of the hill but is partly ruined.

Summers are hot, winters very cold with much snow. Slight earthquakes are frequent, with occasional serious shocks.

Resources. The plain used to be well cultivated with cereals, vegetables, and fruit. Principal exports were dyestuffs, furs, sheep and goats, and their products. There was traffic in fresh and dried fish, and soap was made from the alkaline efflorescence of the lake-shores. European goods came by way of Trabzon and Erzurum.

History. Van has its name from Biaina, the first historical dynasty of

Armenia (*c.* 833 B.C.). It was besieged by Assyria in 735 B.C., and was in alliance with Assurbanipal in 645 B.C. The exploits of Xerxes are recorded on the citadel rock. After Alexander's conquest the Persian governor became independent. In 149 B.C. Van was rebuilt by the first Arsacid king of Armenia, and was colonized with Jews by Tigranes (94–56 B.C.). The Arsacid dynasty was displaced by a Sassanid prince about A.D. 350. Van fell in succession to the Arabs about A.D. 640, to the Seljuks (1050), to Tamerlane (*c.* 1400), to the Persians, to the Ottoman Turks (1543), and to the Persians again temporarily in 1636. In 1845 it was held for a while by a Kurdish chief, Khan Mahmud. It was in one of the most misgoverned parts of the late Ottoman Empire, and was the scene of constant rebellions of nationalist Armenians, ruthlessly suppressed.

In 1914 the population was estimated at 10,000 Moslems (mostly Kurds) and 25,000 Armenians. The Russians took the town early in 1915, but evacuated it in August, when most of the Armenians also left. Subsequently many Armenian villages in the neighbourhood were sacked and the inhabitants massacred. By 1918 the town was almost derelict, the countryside was destitute and starving, and there is no recent information as to its recovery. But it is now the capital of the vilâyet; new roads have been built, a railway is projected, and it is said that the Kurds have settled down.

Communications. There are no motor-roads in the Van district, but a number of cart-roads are being converted. The most important are the Van–Bitlis road along the south shore of the lake, and the road SE. to Hakâri. Other cart-roads link Van E. with Kâzimpaşa, NE. through Muradiye with Doğubayazidi, and N. round the lake with Erciş and Ahlat.

A railway is projected from Van E. to the Persian frontier.

YOZGAT. 39° 49′ N., 34° 49′ E.; alt. 4,330 ft. Vil. cap. Pop. 13,650 (1935). Bank (Agricultural). Hotels (3). Electricity station (medium).

The town stands on both banks of a tributary of the Delice Irmak, near the head of a narrow valley, commanded on all sides by barren hills. The bazaars are stone-built, and there are good baths, some modern houses, and a few trees and gardens about the town; but it suffered damage by earthquake in 1939.

Local resources are limited. Some cereals and opium are grown; horses, sheep, and goats are bred on the pastures, and there is trade in wool and mohair.

Formerly a mere *yayla* or summer grazing ground, Yozgat was founded by Ahmet Paşa of the Çapan Oğlu family of *derebeys* in the eighteenth century.

Communications. It owes its importance almost entirely to its position as a road centre and to its selection as the provincial capital. There are motor-roads SW. to the Delice Irmak at Yerköy, for Ankara by rail

(route 4) or Kirşehir by road; SE. to Kayseri; E. to Sivas; and N. through Çorum to Samsun.

ZILE (Zilleh; *class.* Zela). 40° 18′ N., 35° 54′ E.; alt. 2,152 ft. (rly. stn.). Tokat vil.: kaza. Pop. 15,150 (1935). Electricity station (small).

The town is surrounded by gardens and vineyards in a rich plain at the foot of a hill with barracks and medieval castle. A rock-hewn passage leads from the castle to a spring.

Supplies are plentiful, cereals and fruit being grown. Wool, woollen goods, and rugs are made.

History. Ancient Zela owed its existence to the great temple of Anaitis, with large tracts of fertile land, numerous sacred serfs, and princely high-priest. With the kingdom of Pontus it was annexed by Rome about 64 B.C. after the final defeat of Mithridates VI. It became a city under Pompey's settlement, and in medieval times is often mentioned by Arab travellers as a prosperous town. Fragments remain of a Byzantine church.

Communications. On the Sivas–Samsun railway (route 12). There are motor-roads N. to Amasya and NE. to Turhal; a rough road E. to Tokat; and a number of bridle-paths.

APPENDIX C

CHIEF EXPORTS AND IMPORTS (in £T. thousands)

EXPORTS

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Tobacco	43,160	29,093	27,140	21,416	13,185	18,950	24,463	43,968	39,338	38,924	24,233
Nuts	11,988	10,725	8,173	9,607	8,902	12,502	16,107	12,550	15,225	9,910	8,460
Fruit	14,304	16,261	14,304	10,638	10,078	14,964	14,292	9,583	20,331	10,183	7,187
Dried vegetables	1,458	906	1,058	1,837	2,014	2,373	2,063	2,501	2,708	2,602	2,946
Mohair	2,888	1,605	1,635	2,380	3,778	2,143	7,071	5,725	3,575	7,653	6,582
Cotton	14,270	6,321	2,747	1,233	5,183	6,782	9,083	5,405	10,140	4,179	8,130
Wool and skins	1,699	1,895	1,298	1,976	3,885	1,994	6,116	6,975	3,499	4,817	3,769
Silk and cocoons	453	162	67	57	85	102	160	246	386	616	654
Cereals	3,332	7,593	7,723	4,725	10,974	6,533	5,505	18,923	15,699	6,877	9,767
Livestock	7,546	8,007	6,357	5,303	5,776	4,433	3,416	2,993	2,922	2,444	1,274
Valonia	1,546	1,269	1,480	1,790	1,373	1,323	1,624	1,520	1,700	1,619	887
Opium	3,396	2,818	1,920	3,238	361	1,064	1,548	1,605	953	2,685	3,566
Eggs	8,326	10,357	8,026	4,805	2,628	1,369	1,682	695	798	1,688	1,707
Olive oil	1,843	6,111	773	3,442	1,939	1,829	321	1,623	1,522	2,038	6,070
Carpets	3,998	2,431	1,158	796	505	433	766	391	2	..	6
Coal	1,017	1,661	3,784	3,811	3,204	2,650	2,483	1,554	2,033	1,229	807
Chrome ore	1,375	1,131	1,579	2,668	2,899	2,870	2,922	3,995	5,138	4,648	3,224

IMPORTS

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Cotton cloth and cotton goods	28,498	28,858	16,739	15,761	13,569	14,280	13,549	17,140	17,260	12,757	5,414
Woollen cloth, leather, woollen and leather goods	8,925	7,036	3,052	2,951	2,243	1,976	2,287	2,695	3,553	1,336	803
Cotton yarn	3,766	4,301	3,818	3,072	3,598	2,670	3,067	5,476	5,205	3,550	1,258
Wool yarn	1,930	2,029	2,503	3,190	3,893	2,975	3,561	5,058	3,802	3,464	1,474
Paper	1,589	1,080	1,034	763	918	782	835	1,062	1,295	1,777	1,265
Sugar	9,178	4,838	3,007	1,589	424	268	1,415	875	4,161	1,962	962
Tea	1,241	1,077	663	804	623	449	843	868	837	861	1,193
Coffee	3,569	2,474	2,310	1,759	1,541	1,334	1,590	1,998	1,507	1,488	1,070
Iron and steel	20,203	16,238	10,429	9,064	12,669	16,579	14,414	18,292	28,173	20,146	6,024
Copper and copper alloys	2,201	2,154	1,386	1,085	1,665	1,946	2,056	2,743	3,013	4,096	695
Machinery*	11,690	10,952	8,207	6,710	12,916	9,243	12,202	15,058	23,013	19,958	8,916
Agricultural implements	1,386	776	648	224	555	389	826	1,787	1,536	1,024	1,645
Benzine	2,359	1,509	1,117	340	1,020	866	954	1,410	1,914	1,954	3,630
Petrol	1,554	1,418	1,232	419	923	755	730	1,123	1,335	1,114	2,319
Heavy mineral oil	2,080	1,114	1,062	2,247	1,130	1,332	1,315	1,688	2,268	2,326	2,896

* Believed to include the agricultural implements given separately.

APPENDIX D

FOREIGN TRADE

Imports and Exports by Ports and Frontiers (in £T.)

A. BLACK SEA

Ports	IMPORTS					EXPORTS				
	1936	*1937*	*1938*	*1939*	*1940*	*1936*	*1937*	*1938*	*1939*	*1940*
Hopa	18,869	56,964	60,261	110,486	334,375	121,724	269,091	664,245	1,045,375	570,907
Rize	6,859	1,046	13,300	58,071	38,047	5,776	77,070	4,459	20,250	..
Of	14,541	..	..	..	..	488	3,900	..	..	..
Sürmene	12,771	47	..	2,119	..	400	8,570	..	..	..
Trabzon*	658,252	649,793	722,710	720,998	66,108	4,304,290	3,808,040	4,522,055	2,654,739	1,904,124
Akçaabat	19,132	62,365	136,534	46,951	65,571	95,515	95,509	..	..	..
Tirebolu	..	..	..	..	..	28,650	500	76,247	104,218	21,079
Giresun, Bulancak	63,303	45,844	20,958	4,122	199	5,624,507	4,277,860	4,403,744	2,474,799	1,886,073
Fatsa	..	..	..	..	..	641,063	391,297	881,989	463,815	186,732
Ünye	112	..	23,028	..	..	340,856	122,743	673,700	266,071	35,666
Ordu (Vona)	42,479	1,227	24,781	700	36	2,256,174	1,537,004	2,299,367	1,515,059	379,304
Samsun	699,557	1,010,456	1,175,099	1,222,956	133,784	2,452,267	4,938,513	5,008,199	5,659,880	2,865,593
Sinop	712	..	..	..	..	7,344	..	..	..	..
Ayancik	66,131	48,684	60,012	89,680	12,147	72,949	72,374	..	..	..
Inebolu	48,483	43,752	26,266	33,392	12,050	310,473	115,255	140,605	418,384	86,112
Cide	372	..	..	..	..	1,217	..	..	..	..
Bartin	734	26,048	..	..	..	1,560	672	709	300	..
Zonguldak	747,808	653,826	1,140,108	1,363,122	454,116	1,727,029	908,696	1,269,074	711,327	551,672
Ereğli	7,420	11,142	32,101	156,222	6,406	415,221	199,925	263,693	241,979	49,708
Others†	17,686	6	4,509	12,583	17,867	390,132	263,564	271,467	143,511	105,036
Total	2,425,221	2,611,200	3,439,667	3,821,402	1,140,706	18,797,635	17,090,583	20,479,553	15,719,707	8,642,006

* Including Mumhane, Değirmendere, Yaliboyu.
† Pazar (Atina), Vakfikebir (Büyükliman), Görele, Akçaşehir, Incili, Kefken, Agva, Şile, Midye, Iğneada, and Amasra.

B. MARMARA AND ISTANBUL

Ports	IMPORTS					EXPORTS				
	1936	1937	1938	1939	1940	1936	1937	1938	1939	1940
Haydarpaşa	11,469,365	11,286,716	23,665,537	18,669,592	9,046,685	255,077	2,465,229	831,205	386,188	2,623,931
Derince	913,757	1,440,232	594,152	803,643	17,677	1,565,137	3,095,446	1,428,813	238,820	730,927
Izmit	274,647	753,687	1,883,722	2,272,703	1,538,325	4,875	..	27,838	20,891	84,086
Mudanya, Gemlik	626,952	2,358,384	1,378,892	1,726,986	1,057,860	156,628	71,703	103,512	74,774	396,013
Bandirma	8,857	229	41,916	44,596	28,201	1,076,987	1,103,131	1,572,476	7,010,150	2,007,989
Erdek	..	..	..	..	..	11,244	604	1,929	..	..
Marmara	..	..	..	..	..	20,027	30,206	41,939	59,321	27,566
Karabiğa	358	..	..	..	..	313,518	432,319	211,527	151,276	44,381
Çanakkale	43,405	178,221	114	40,683	584	171,087	185,581	320,133	298,784	334,792
Gelibolu	51	711	1,373	..	..	100,266	108,095	100,311	121,224	39,672
Tekirdağ	97,723	90,500	130,267	267,357	..	1,028,200	1,680,600	1,412,395	792,165	190,930
Istanbul, Galata, Sirkeci	60,782,746	74,087,445	92,329,949	71,362,209	47,351,767	35,086,456	39,129,510	34,032,296	45,337,694	57,029,805
Karacabey, Lapseki										
Darica, Silivri, Şarköy, and Mürefte	1,113	..	..	..	..	38,823	..	..	..	..
Total	74,218,974	90,196,125	120,025,922	95,187,769	59,041,099	39,828,325	48,302,424	40,084,374	54,491,287	63,510,092

C. AEGEAN SEA

Ports	IMPORTS					EXPORTS				
	1936	1937	1938	1939	1940	1936	1937	1938	1939	1940
Küçük Kuyu	1	..	..	..	..	11,331	23,842	11,499	1,795	14,843
Ilica (Akçay)	131,009	150,555	94,136	35,321	11,381	709,273	1,387,376	699,223	848,318	116,176
Burhaniye	4	..	..	..	..	19,361	17,861	27,978	3,695	20,346
Gümüşlük	..	..	..	..	..	1,650	1,116	56,321	28,084	..
Ayvalik	45,465	40,554	49,547	26,337	40,815	108,820	212,162	261,635	765,954	128,416
Dikili	..	..	..	3,550	..	214,616	208,936	224,644	150,399	252,844
Foça (Eskifoça)	45	..	..	..	..	250,495	202,821	125,759	231,779	26,819
Izmir	7,736,835	12,522,283	13,202,108	9,615,953	5,108,025	39,412,202	50,396,014	59,969,903	39,450,392	27,547,613
Çeşme	15,381	10,035	..	..	115	32,840	3,471	3,920	15	1,506
Uria	125	..	85,909	..	..	29,286	6,947	579	2,450	..
Kuşadasi	1,931	114	52	..	1,787	102,487	53,987	60,894	168,746	163,155
Karina	..	..	..	..	..	8,804	15,951	22,416	16,439	52,861
Yenihisar	..	..	..	..	..	23,392	24,413	37,532	46,397	8,711
Küllük	9,303	11,182	7,557	4,435	..	197,132	199,429	177,731	184,822	144,256
Bodrum	1,565	2,751	822	316	108	23,672	88,924	148,947	86,503	67,765
Gökabat	..	..	..	..	..	231	2	25,470	..	..
Others†	129	2,679	153	474	..	142,821	110,509	51,120	36,118	43,520
Total	7,941,793	12,740,153	13,440,284	9,686,386	5,162,231	41,288,413	52,953,761	61,905,571	42,021,906	28,588,831

† Marmaris, Ibrice, Bozcaada, Geyikli, Kösedere, Babakale, Imros.

D. MEDITERRANEAN SEA

Ports	IMPORTS					EXPORTS				
	1936	*1937*	*1938*	*1939*	*1940*	*1936*	*1937*	*1938*	*1939*	*1940*
Dalyan (Köyceğiz)	..	150	381	..	6	3,540	20,186	95,362	37,251	9,006
Dalaman (Sarisu)	901	..	..	..	..	6	..	..	2,577	46,313
Fethiye	56,192	18,302	30,382	5,359	7,437	1,445,847	1,734,305	1,643,820	1,175,534	373,177
Kalkan	..	..	..	..	..	33,587	40,236	47,395	5,924	4,505
Andifli	..	..	..	..	546	24,510	9,400	10,060	21,426	13,484
Finike	..	..	..	5,269	..	62,434	129,577	95,638	191,360	23,653
Antalya	59,041	89,401	79,220	91,423	22,730	511,551	1,001,838	817,311	356,474	133,675
Alâiye (Alanya)	243	..	..	60	200	15,295	15,588	221	..	..
Anamur	16,094	24,225	1,610	13,786	..	20,107	234,711	165,893	124,538	5,903
Taşucu	..	..	..	..	..	176,370	376,125	240,463	151,442	82,983
Mersin	5,876,120	5,777,067	10,454,133	7,787,113	1,687,292	9,812,753	9,942,425	15,450,137	9,527,299	6,904,675
Ayaş	..	..	..	..	..	33,780	104,663	66,171	87,938	70,705
Payas	322,320	438,109	759,352	396,387	..	1,457,213	2,485,515	1,548,641	964,996	245,180
Iskenderon	..	..	..	426,073	1,294,074	..	..	..	389,448	968,721
Total	6,330,911	6,347,254	11,315,078	8,725,470	3,012,285	13,596,993	16,094,569	20,181,112	13,036,207	8,881,980

E–J. FRONTIERS

Names of ports and frontiers	IMPORTS					EXPORTS				
	1936	*1937*	*1938*	*1939*	*1940*	*1936*	*1937*	*1938*	*1939*	*1940*
E. BULGARIAN FRONTIER										
Malkoçlar, Çalidere, Mustafapaşa, Edirne .	25,338	15,409	17,326	45,463	40,881	20,319	39,561	22,254	14,378	4,620
F. GREEK FRONTIER										
Uzunköprü, Ipsala, Enez .	23,956	6,716	148,075	18,276	19,258	117,829	127,887	136,081	133,388	71,991
G. SYRIAN FRONTIER										
Syrian frontier . .	371,676	565,550	446,028	204,876	358,428	2,269,288	2,137,472	832,327	777,253	693,672
H. IRAQ FRONTIER										
Iraq frontier . .	2,602	338	..	..	..	46,583	17,679	14,134	15,053	2,251
I. PERSIAN FRONTIER										
Persian frontier . .	738	4,693	2,114	138	2,655	596	9,898	566	..	8,742
J. RUSSIAN FRONTIER										
Russian frontier . .	1,190,265	1,891,588	1,002,195	559,154	145,165	1,767,172	1,209,717	1,290,539	1,179,818	42,301
GENERAL TOTAL (A–J)	92,531,474	114,379,026	149,836,689	118,248,934	68,922,708	117,733,153	137,983,551	144,946,511	127,388,997	110,446,486

APPENDIX E

AUTHORSHIP AND AUTHORITIES

Authorship

THIS volume has been written by Lieut.-Cólonel K. Mason (Professor of Geography, Oxford University), Miss M. Marshall (School of Geography, Oxford University), and Professor J. L. Myres (New College, Oxford), with Mrs. M. J. Custance and Miss H. F. Pickard-Cambridge as assistants. Contributions by the Principal of Hertford College, Oxford (N. R. Murphy, Esq., M.A.), Dr. J. V. Harrison (Department of Geology, Oxford University), and Colonel H. A. J. Parsons, late Royal Corps of Signals, have been included. Some technical information has been received from the War Office, the Ministry of Economic Warfare, the Royal Institute of International Affairs, the Royal Geographical Society, and from Mr. W. D. W. Matthews, whose experience of the country has been invaluable.

The text-figures and maps have been prepared by the drawing-office of the Oxford sub-centre under the direction of Mr. K. W. Hartland. The Turkish rugs illustrated in plates 68, 69, and most of the road-bridges, were drawn by Miss M. Potter.

Authorities

Some material has been obtained from men with personal knowledge of the country; most of it, both statistical and otherwise, and most of the illustrations and figures, are from Turkish and other foreign sources, amongst which may be mentioned the annual reports of Public Works (*Bayindirlik Işleri Dergisi*), reports by railway-constructional engineers, and accounts in foreign mining and other technical journals.

No bibliography useful to the English reader can be given, for no detailed books in the English language dealing with these aspects of modern Turkey have yet been published. A list of maps and of a few of the books consulted is given in Volume I, Appendix F.

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Additional references may also be given under the alternative names which are sometimes shown in brackets. The Index should be used in conjunction with the Table of Contents at the beginning of the volume, which is fully paged.

B. = bay; C. = cape; Ç. = Çay (stream); D. = dere (valley); L. = lake; R. = river; r.s. = railway station.

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